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Rock Products

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Chicago, June 27, 1925 (*Issued Every Other Week*) Volume XXVIII, No. 13

Plymouth 18 ton Gasoline Locomotive hauling five loaded coal cars, two empty cars and caboose on 1/2 of 1 per cent grade

Plymouth Cuts Haulage Cost

No matter what the enterprise or industry, if haulage is a problem, the Plymouth is the solution. Always ready, no coal to haul, no "firing up," no boiler troubles, no "stand by" expense—the Plymouth is rapidly displacing antiquated haulage methods.

The Plymouth Gasoline Locomotive is the pioneer in gasoline locomotive development. It has been the color-bearer for a score of years. It is the pacemaker with more speed, more power and more years of service.

In the quarry, in the sand, gravel or clay pit, in the mine or forest, in construction work, at the industrial plant, or for short line railroads, the Plymouth is the economical method of haulage.

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THE FATE-ROOT-HEATH CO. *(Plymouth Locomotive Works)* **Plymouth, Ohio**

PLYMOUTH
Gasoline Locomotives

MEMBER A.B.C. *The Only Paid Circulation in this Industry* MEMBER A.B.P.

Printing of This Issue Is 5300 Copies. Next Issue Will Be July 11

THE "101" CARRIER

—Getting Out that Michigan Sand

THERE is an S-A Belt Conveyor installation at Port Crescent, Michigan, that is moving an enormous tonnage of lake sand, taking the material from the beach and loading it into steamships for shipment to points of sale. The aggregate length of these conveyors totals about 5,000 feet. The installation will handle 7,500 tons each ten-hour day when running to capacity, but needs the labor of only twelve men each shift. Vessels of 1,000 tons to 8,000 tons capacity are loaded. The conveyor system is equipped with S-A Ball Bearing Unit Carriers. The entire system, consisting of a number of conveyors, is readily movable as the work progresses. The responsibility for the design and construction was assumed by S-A Engineers.

Your own material handling problems could just as easily be solved by the experts in our service.

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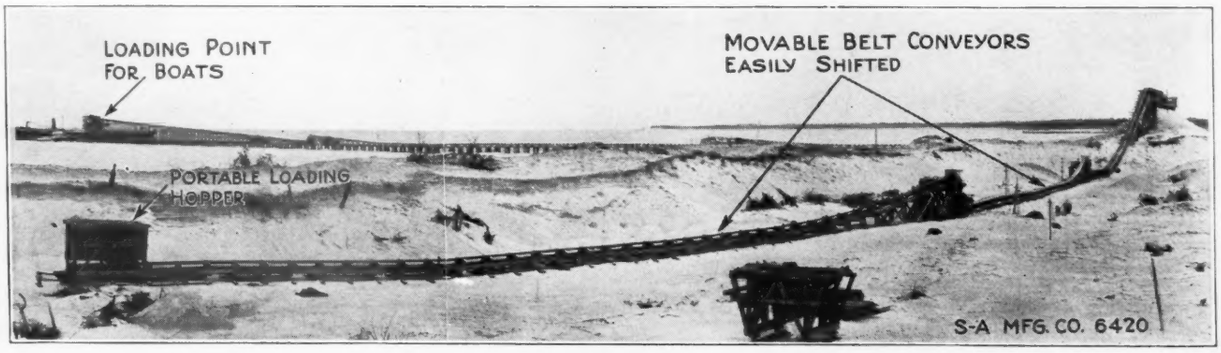
On S-A Unit Carriers



DESIGNERS & BUILDERS OF LABOR SAVING MACHINERY

AURORA S-A MFG.CO ILLINOIS

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Volume XXVIII | Chicago, May 27, 1925 | Number 13

New Plant of the Interstate Sand Gravel Company, Covington, Indiana

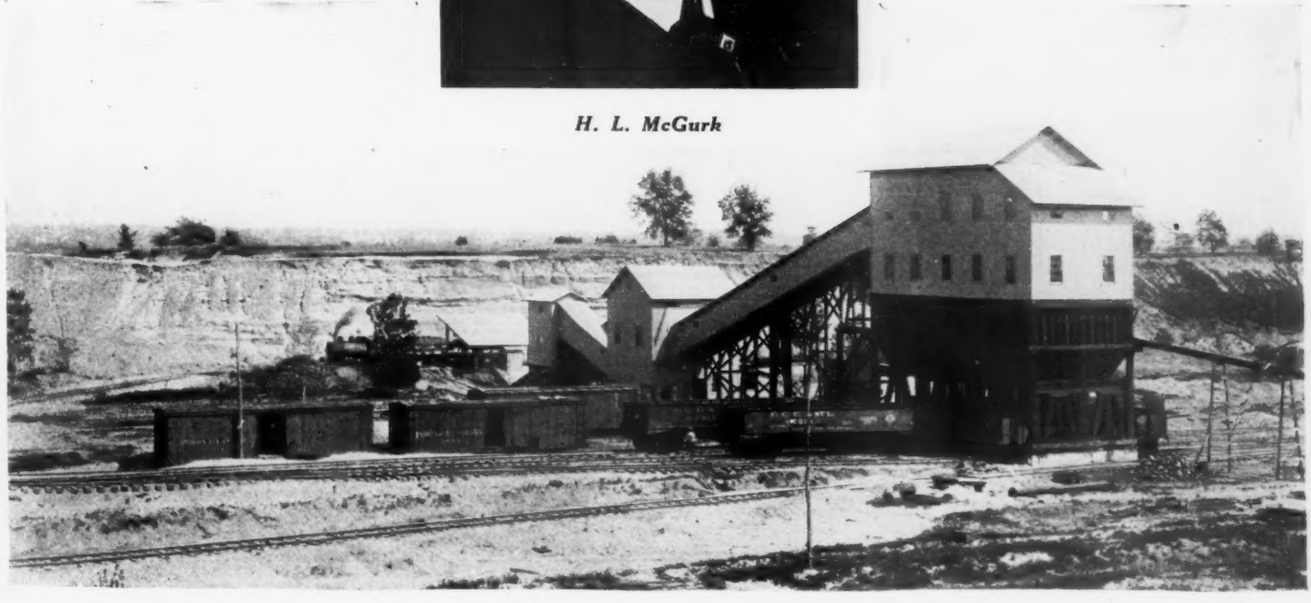
Compact and Efficient, It Summarizes the Years of Experience of a Very Successful Operator

COVINGTON, Ind., is one of the large gravel producing centers of the Wabash valley, from which so much material is supplied for highway and structural work in both Indiana and Illinois. The Interstate Sand and Gravel Co. has had a plant there for a number of years. Recently they have built a new plant, as the old one was unable to care for the constantly increasing business. This plant was designed by Frank Welch, of the engineering department of the Greenville Gravel Co., and it is one of the best plants that has been erected in the district.

The deposit on which the new plant is built is 40 ft. in depth and extends over a large acreage. All of it is above the water level of the country, making it an ideal deposit for steam shovel operation. A Marion 37 electric shovel has recently been acquired for this, and an Erie steam shovel which has been in use for some time will be employed as an auxiliary.

There is about 2½ ft. of top soil above the deposit and this is stripped hydraulically. Water for this purpose has to be pumped from the river, and as the height and distance are considerable, the cost of pumping is kept down by reusing the water as much as possible. The water from the hydraulic monitor, carrying its load of silt, is sent to a settling flume in a worked-out portion of the ground. Here the silt and loam settle out and the comparatively clear water is

H. L. McGurk



General view of the new Covington, Ind., plant of the Interstate Sand and Gravel Co.

Settling pond for water used for hydraulic under construction

Unloading hopper over which standard gage railway cars pass

pumped back to the monitor to be used over again.

From the deposit the bank material is taken in 12-yd. standard gage cars by a Davenport locomotive to the plant hopper. This is of concrete, 24x26 ft. and 20 ft. deep. A feeder from this hopper (of the revolving cylinder type) feeds the material to a 30-in. conveyor belt which takes it to the scalping screen.

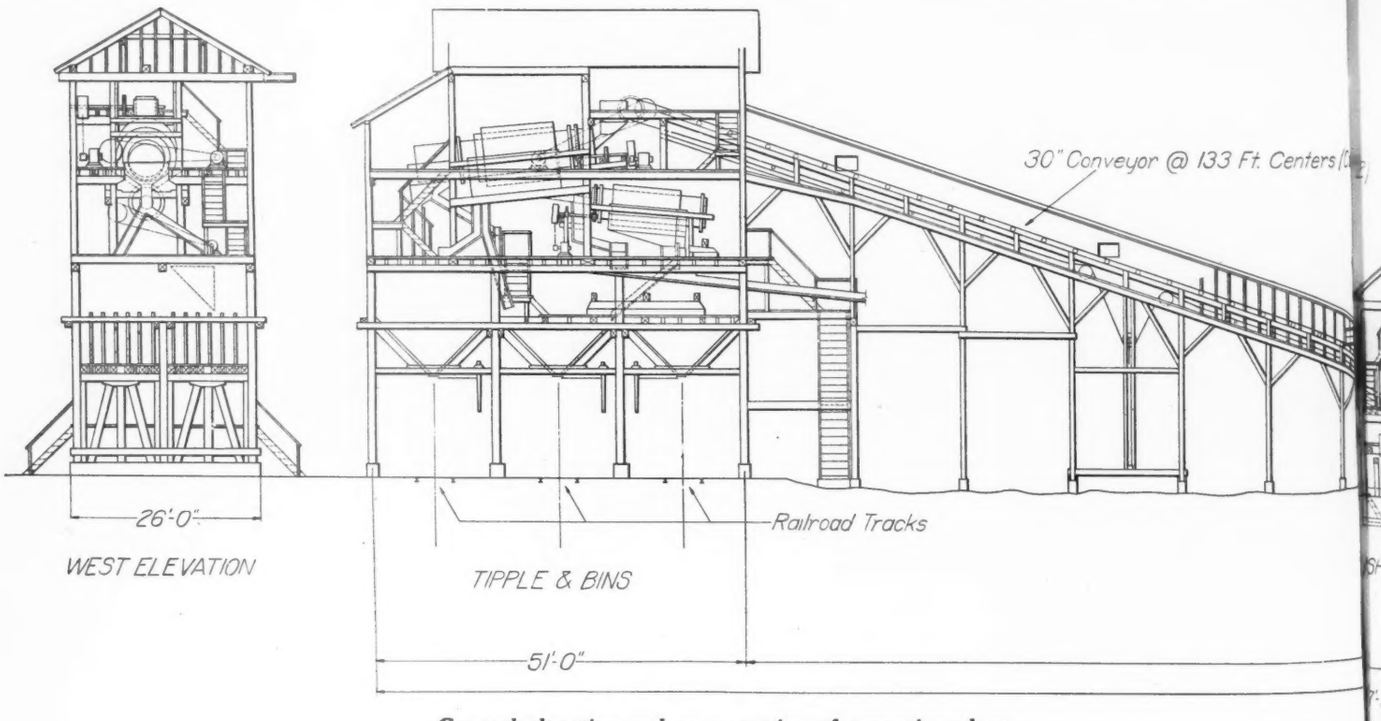
The scalping screen is 14 ft. long and has 2x2½-in. round hole perforations. The undersize falls into a steel chute through which it flows to a second 30-in. belt conveyor that takes it to the main sizing screen of the plant.

The oversize of this screen falls by gravity to either or both of two crushers. One of these is a No. 4 Allis-Chalmers Gates type, the other is a No. 5 McCully gyratory, also made by the Allis-Chalmers Co. The product of these crushers falls to a 24-in. belt, running in the opposite direction from the others mentioned, which takes it to the "head house."

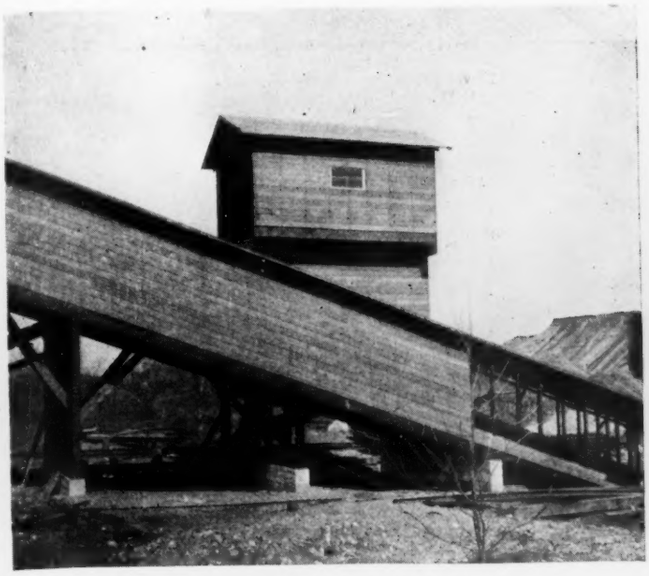
This "head house" contains the head pulley of the 24-in. conveyor and the motor. The drive of the crushers is through a short shaft in the crusher house driven by a 50 h.p. motor in the head house. Pulleys on this shaft are belted to the crushers.

The crusher house is a substantial building 25x26 ft. and 26 ft. high. Both crushers and the shaft from which they are driven are placed on massive concrete foundations. An I-beam and chain hoist placed above the crushers allows any part to be lifted in making repairs.

As the crusher discharge is returned to the scalping screen, only the undersize of this screen can go to the sizing screen which is in the main building of the plant. This screen is of the triple-jacketed type, the main cylinder being 25 ft. long. The first 4½ ft. of this is a scrubbing section with lifters for turning the material in the water which is added here. It is supported on tires that run on trunion wheels, leav-



General elevation and cross section of screening plant



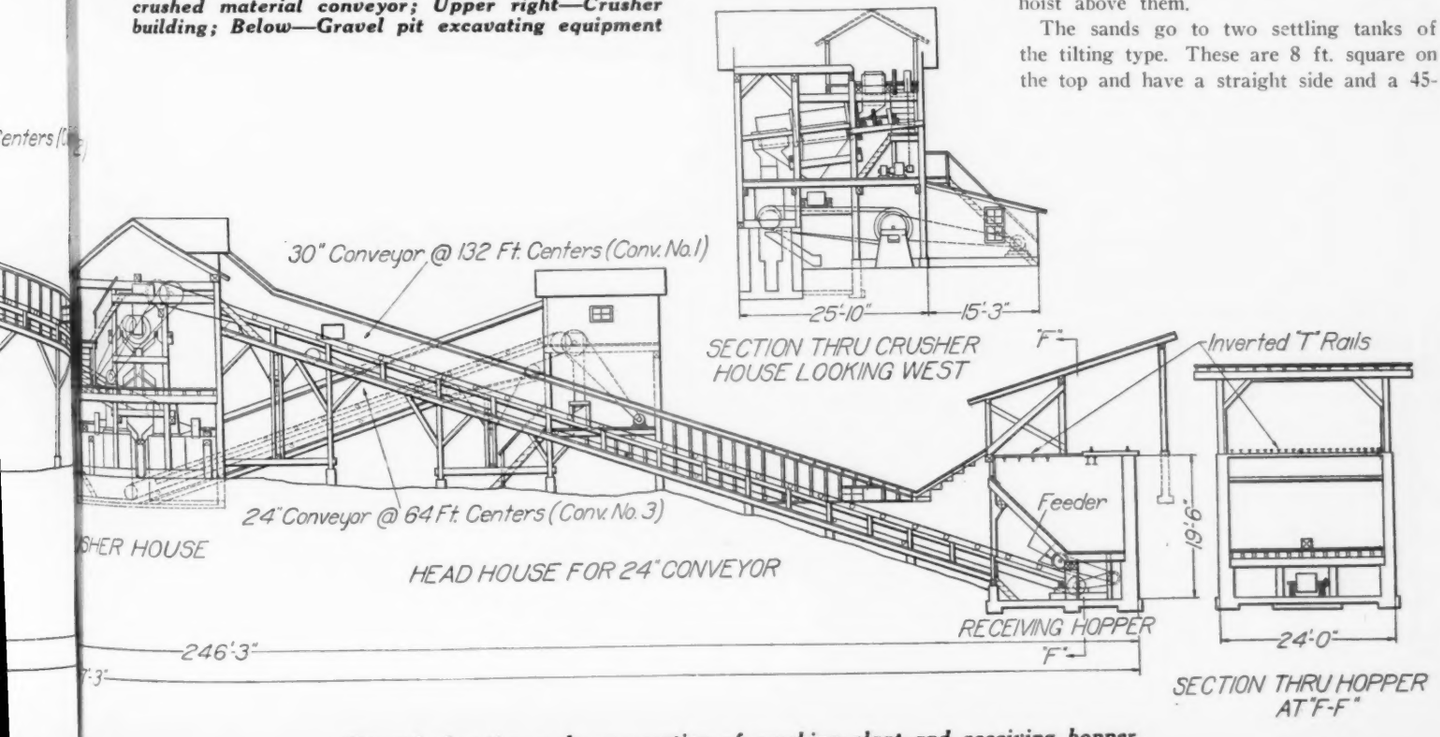
Upper left—Conveyor gallery and head house for crushed material conveyor; Upper right—Crusher building; Below—Gravel pit excavating equipment

ing the interior of the screen free from shaft and spider so that large water pipes and heavy sprays may be used. The greater part of the wash water will be applied here, thoroughly scrubbing the material as well as helping it through the screens.

The screen is set at an inclination of 1¼-in. to the foot. The inner jacket has 1½-in. and 1¼-in. perforations; the second jacket has ¾-in. round holes, and the outer jacket has ¾-in. x ¼-in. slots.

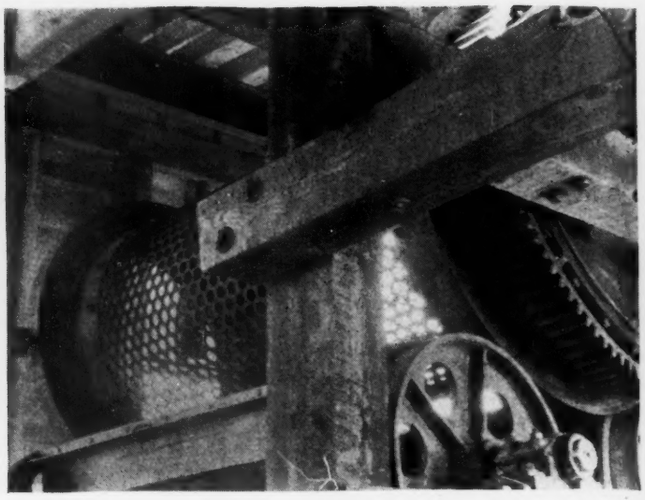
All the sizes except that made by the ¾-in. x ¼-in. slots go to bins. The remaining size goes to the sand screen which is on a floor below the main sizing screen floor. This sand screen is 16½ ft. long and makes two sizes of sand, ¼-in. down and 1/10-in. down. Both the sizing screen and the sand screen have I beams with chain hoist above them.

The sands go to two settling tanks of the tilting type. These are 8 ft. square on the top and have a straight side and a 45-



General elevation and cross-section of crushing plant and receiving hopper

No. 6 crusher for reducing gravel



Scalping screen in crusher house

deg. side, down which the sand flows to the discharge outlet. This outlet is a short piece of 10-in. pipe which, when the tank is empty or filled with only water, butts against a pad on a timber. The weight of the sand causes the tank to swing on its knife edge supports so that the pipe moves away from the pad and allows the sand to run out. This is one of the simplest forms of automatic discharge sand settlers that has been invented. The same kind of tank was in use in the older plant of this company and it was so satisfactory that the company decided to use it in the new plant.

All the screening and conveying machinery was supplied by the Greenville Manufacturing Co. The conveyors have all ball-bearing idlers and troughing rolls.

All the motors in the plant were furnished by the General Electric Co. The two 30-in. belts have each a 30 h.p. motor. A 10 h.p. motor drives the scalping screen and another of the same size the sand screen. A 30 h.p. motor drives the large sizing screen.

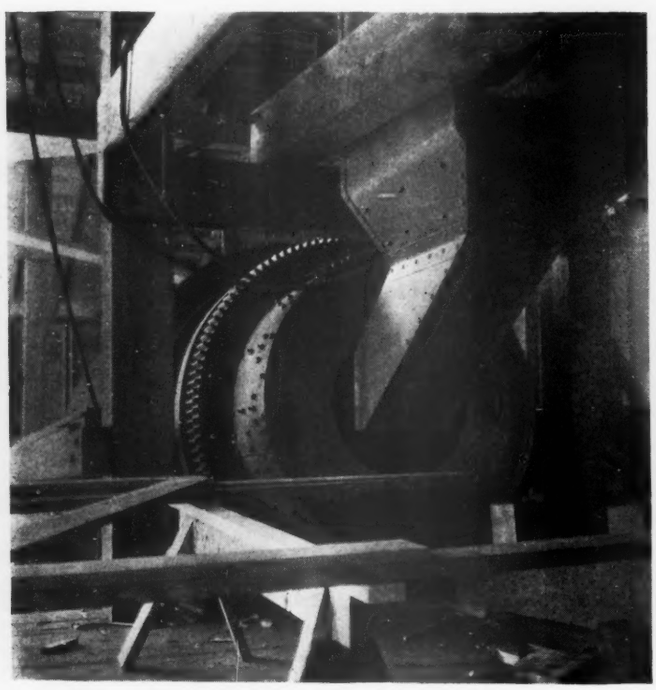
Water for washing is furnished by an 8-in. De Leval centrifugal pump which throws 2000 g.p.m. This is also driven by a General Electric motor.

The plant is almost wholly constructed of Washington fir shipped by train from the Pacific Coast. Some very long and heavy sticks were brought in for the main timbers, 12x12-in. and 8x12-in. pieces, 52 ft. long. The main timbers have all been treated with a preservative compound to keep them from decaying.

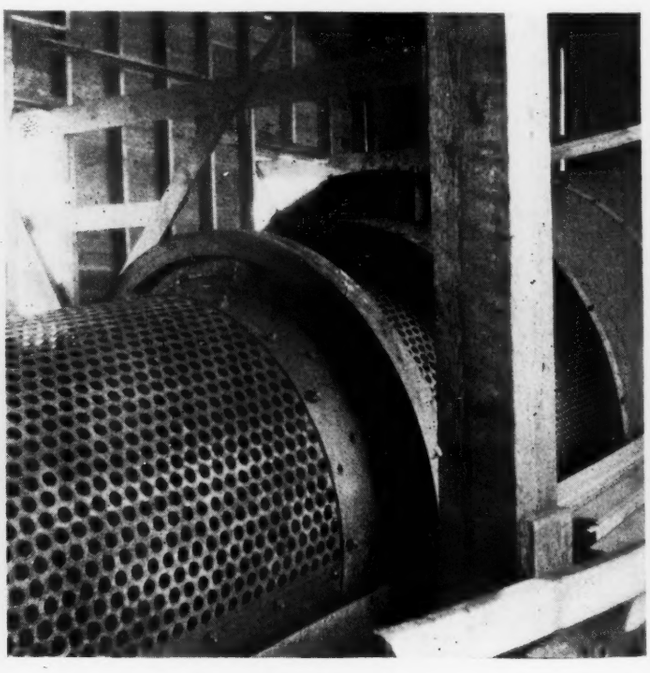
As the pictures show, all the chutes, hoppers and the like, through which the material flows, are of heavy steel plate riveted. This makes them far more resistant to wear than wooden chutes and it also allows a closer connection between the various parts.

The construction throughout is very substantial. All the main timbers being bolted together and the inner surfaces of joints creosoted to prevent decay. The design of the plant is excellent. Without there being any waste space, there is ample room for moving about and for doing any repair work comfortably and speedily. The placing of chain hoists in every place where there are heavy parts to be lifted is a great time saver. As the deposit to be worked is extensive, all this care in design and construction is justified for the plant will serve without changes for a good many years.

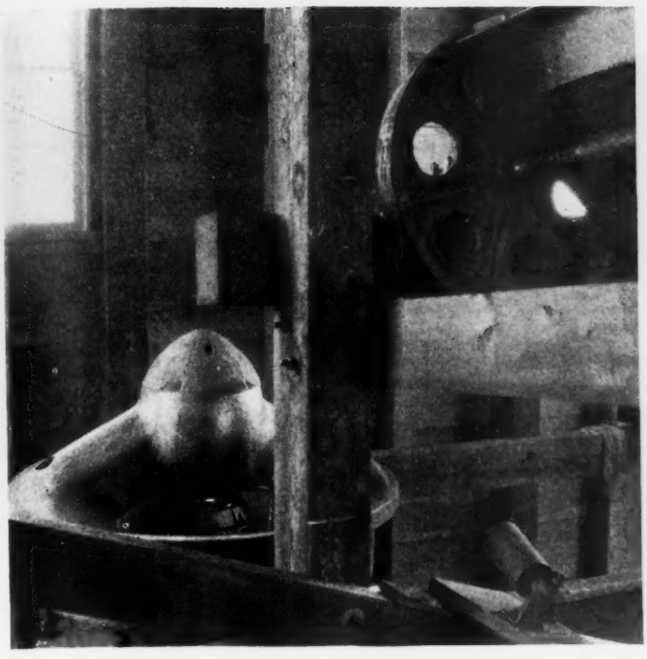
The main offices of the Interstate Sand



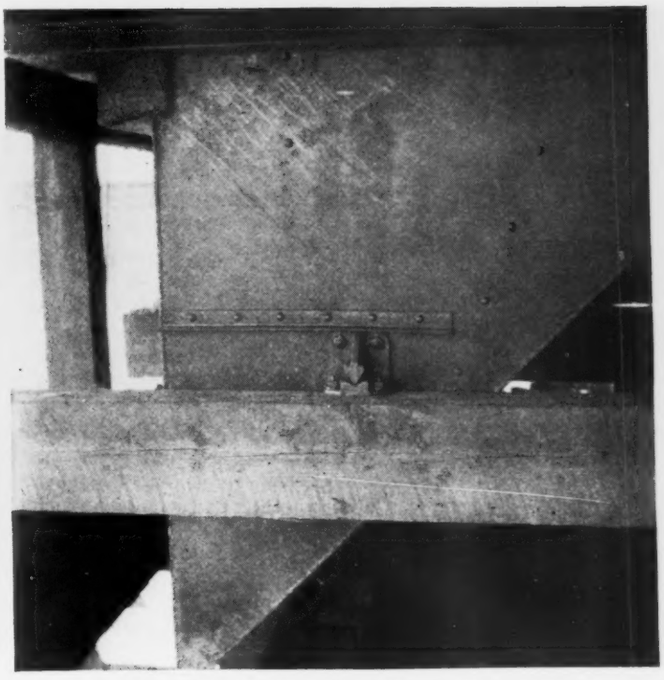
Feed end of sizing screen



Detail of main sizing screen



Crushers for oversize from scalping screen



Detail of sand-settling tank

and Gravel Co. are in the Rose Dispensary building in Terre Haute, Ind. A. M. De Haven is president of the company and H. L. McGurk is secretary and treasurer. Luther Abel is the superintendent in charge of operations at the plant.

Canadian Aggregate Producers Get Together for Promotional Work

UNDER the title, "Your Concrete Highways," Canadian producers of crushed stone and washed and screened sand and gravel have issued copies of a report made to the Minister of Public Works and Department of Public Highways of Ontario by the commercial stone and gravel producers of the province. The book is a compilation of excerpts from engineer's report, Portland Cement Association records and other literature, and from editorials and articles which have appeared in ROCK PRODUCTS. It is well done. The excerpts are short and they were carefully chosen and edited. Every one of them drives home the truths that concrete can be no better than the materials of which it is made and that the only way to be sure of obtaining good aggregates is to buy them from the commercial producer whose very living—not to speak of the safety of his capital—depends upon his making a product that will pass standard specifications.

General view of plant from bin side

As in Wisconsin, the producers of crushed stone and sand and gravel have recognized that their interests are identical. They have common enemies to fight in the roadside pit business and the producer of poor material whose stuff sells only because it is cheap. They are doing the public a real service in promoting the use of good aggregate for highways. Dirty and poorly graded aggregate has cost the public tremendous sums spent for building roads that went to pieces rapidly under service. Not much more money spent for good aggregate would have made the roads such that they would have returned their cost many times over in satisfactory service.

A Real Public Service

The introduction contains the following interesting statistics: "Commercial crushed stone and washed gravel plants were established some years ago to provide the construction industry with the very best grade of coarse aggregate, recognized and stated by the most eminent British and American engineers and authorities to be so necessary in the making of permanent concrete.

"To make the above possible, investments totalling $6,200,000 were made in plants employing 774 permanent employees, with an annual payroll of $697,800, annual power payments, mainly hydro, of $77,850, and annual workmen's compensation payments of $34.800." (Figures refer to Ontario only.)

Almost a Mile of Belt Conveyors

Port Crescent (Mich.) Sand and Fuel Company Has a Unique System of Handling and Loading Bank Run Sand

ALONG the shores of the Great Lakes there are several places where there are immense deposits of sand. The best known of these, perhaps, are the Indiana Dunes, which are visited yearly by thousands of people for their picturesqueness. But the sand has valuable commercial qualities, and in localities where its availability for park purposes does not give it a higher value it is worked for a daily production that must run into many thousands of tons in the aggregate.

The sand in many cases has been sorted both by wind and by water which makes it very even as to grain size and also very clean. There is a scanty vegetation supported by the surface layer, but below this is nothing but fine, clean sand which is suitable for many purposes and which can be marketed with no washing or other preparation. The marketing problem includes nothing but excavation and transportation. The sand finds many uses from filling material to core making, glass polishing and as traction sand.

One of the largest and most important operations by which this lake shore sand is recovered and marketed is at Port Crescent, Mich. Port Crescent is on the shore of Lake Huron, on the east side of Michigan, at the entrance to Saginaw Bay. The sand finds its market in those towns which are easily reached by water, Detroit, Buffalo, Cleveland, Toledo and the Canadian lake ports.

A Great Conveying System

The plant is mainly a great conveyor system in which there is nearly two miles of

The entire operation is shown in this two-page photograph. The crane and bucket by which the sand is dug are seen at the left, and nearby is the hopper of the movable field conveyor

belts. The total of all the lengths, taking each length from center to center of pulleys, is 4943 ft. Almost half of this length is in a series of conveyors in a straight line extending from a stockpile along a dock out into the lake. These belts convey the sand to the boats by which it is taken to market.

The entire operation is beautifully shown in one of the large pictures which accompanies this. The sand is dug with a Northwest gas crane, of which three are employed. This has a 1-yd. bucket which discharges into a movable hopper which is at the end of a belt conveyor. The frame of this conveyor rests on ties like those of a railroad track, and the conveyor frame can be moved sidewise on these ties as the work proceeds so as to keep the hopper close to the shovel. The other end of the conveyor discharges on a second conveyor, also movable, and this discharges to a fixed conveyor, marked "A" in the drawing accompanying, which lifts the sand to the stockpile.

Handling In and Out of Stockpile

This "A" conveyor has its elevating section on a 200-ft. vertical radius. It has 330-ft. centers and is driven by a 50 h.p. motor. A second "B" conveyor of 100 ft. centers, takes the sand farther along on the pile. This is driven by a 10 h.p. motor. Below the stockpile are two tunnels in which are conveyors "C" and "I" and these draw off the sand from the stockpile and deposit it on conveyor "D," which is the first of the loading conveyors. This conveyor is of 600 ft. centers and is driven by a 50 h.p. motor.

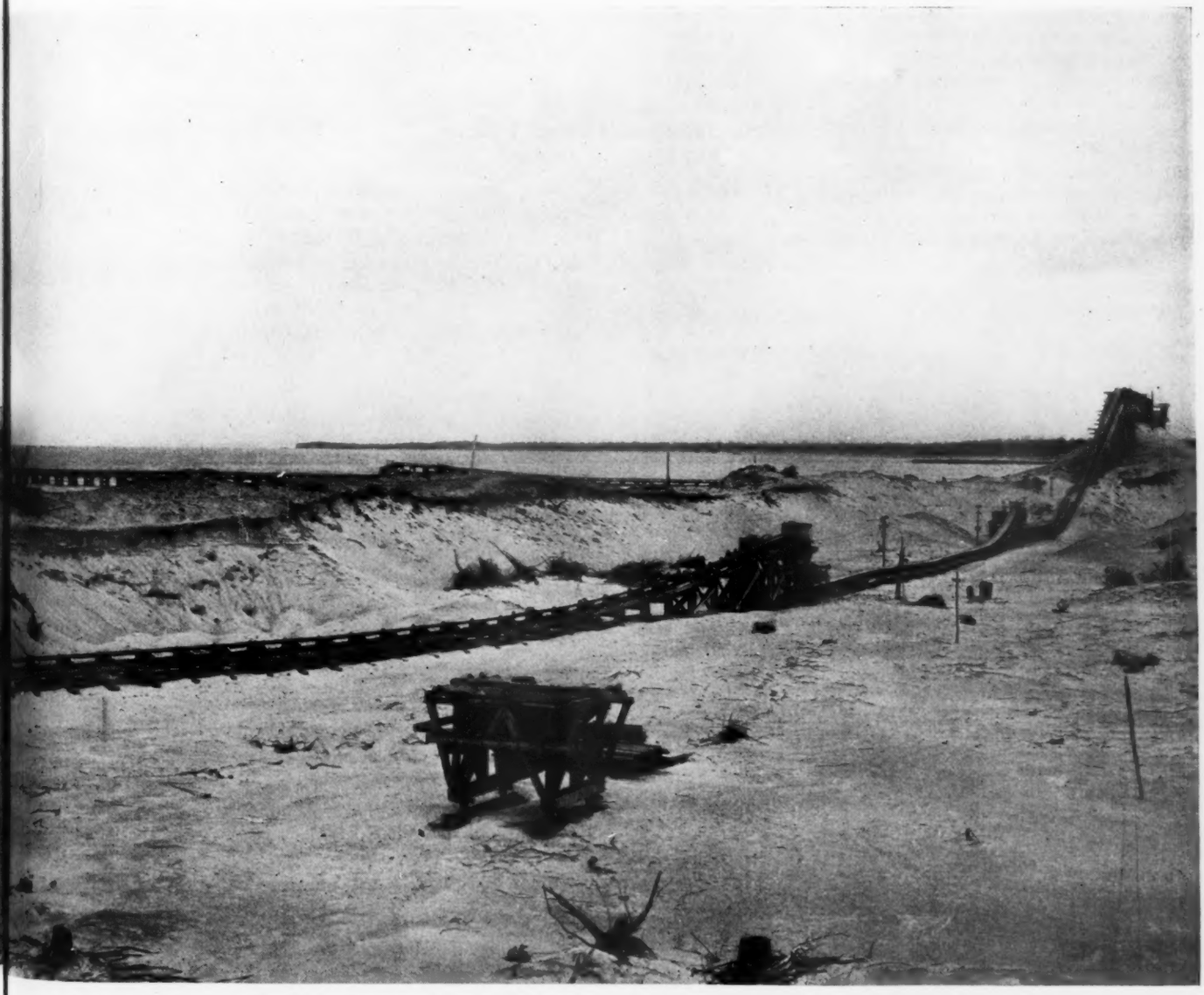
Conveyor "E," which receives the discharge of "D," is likewise of 600 ft. centers and is also driven by a 50 h.p. motor, but conveyor "F," which receives its discharge, not only conveys it another 600 ft. but elevates it 36 ft. and this is driven by a 75 h.p. motor.

Conveyor "F" discharges on a movable conveyor, "G." This is of 43 ft. centers and is driven by a 5 h.p. motor. It is arranged so that it can load a boat at either side of the dock and also so that it may be moved along to trim the cargo as it loads it.

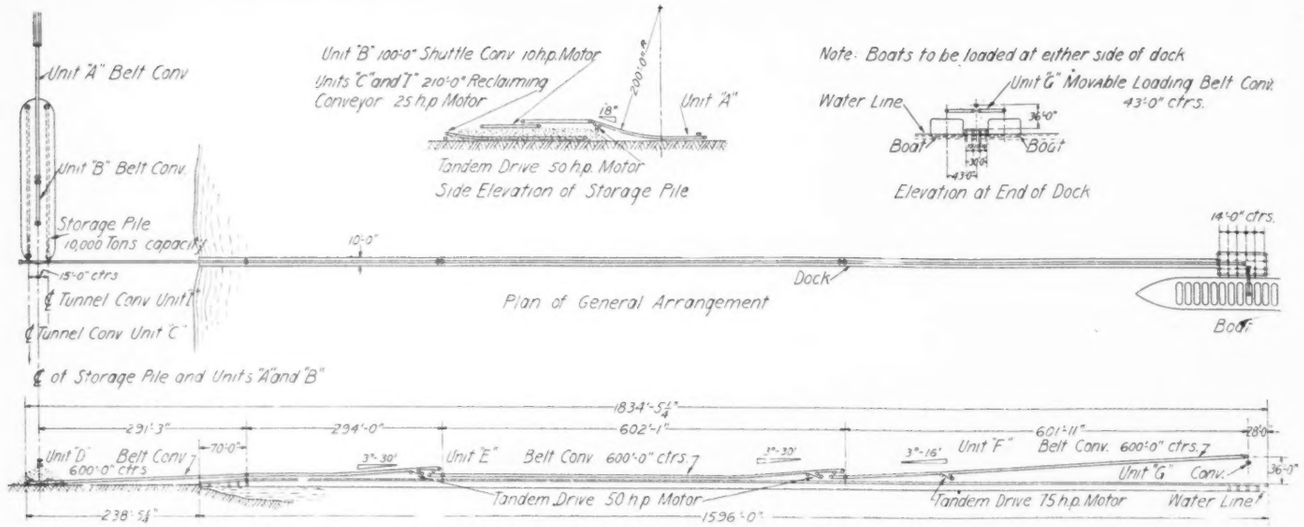
All Conveyors the Same Width

The conveyors not shown in the plan are used in the field. In all there are 11 conveyors, totaling, as has been stated, 4943 ft. The total horse power of the motors required for these is 405 h.p.

All the conveyors are 30 in. wide and they are all of Stephens-Adamson special rubber covered belt with ⅛-in. solid rubber cover on the carrying side and either 7-ply or 8-ply. All the long conveyors have tandem drives, and all motors are of General Electric make of the slip ring type. These motors use 220-volt, 60-cycle, three-phase current. The belt speed is faster than was at one time considered good practice, 410 ft. per minute, but the design and construction of conveyors is so much better today



The field conveyor discharges to two conveyors which carry the sand to the stockpile (extreme right). Conveyors under the stockpile take the sand to the series of conveyors that carries it to the dock and loads it on the boat



This plan and section show all but the field conveyors. The letters are referred to in the text

that there is no difficulty in driving them at such a speed and securing an increased capacity. The entire installation was designed and the construction was supervised by the Stephens-Adamson Manufacturing Co., Aurora, Ill.

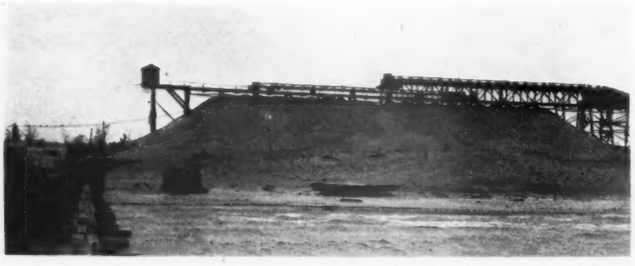
The capacity output of the plant is 7500 tons per 10-hr. day, and to produce this only 12 men are needed on each shift. The boats which are loaded vary in carrying capacity from 1000 to 8000 tons.

The Port Crescent Sand & Fuel Co. has its offices in the First National Bank building, Detroit. The president of the company is Max B. McKee. Frank W. Pearson is vice-president, A. M. Farmer is treasurer and G. F. Wall is secretary.

New Sand and Gravel Plant Operating in Maine

OPERATIONS were begun recently at the new $60,000 sand and gravel washing plant of the Consolidated Crushed Rock and Gravel Co. at South Portland, Maine. The plant was designed and built by the Link-Belt Co. and has a capacity of about 600 tons of washed and graded sand and gravel daily.

Charles B. Dalton is general manager of the company and W. H. Goodwin is superintendent of the plant. The company also has plants at Leeds Junction, Maine, and Milton, N. H. Mr. Dalton was a member of the War Service Committee on Mineral Aggregates during the war.



Left—The stockpile in which the sand from the field is stored. Right—Side view of the conveyors to the dock

Left—The conveyors from the shore to the dock. Right—The dock and the shuttle conveyor that loads the boats

Producers Installing Batchers

Proportioning Devices for Fine and Coarse Aggregate Becoming a Part of Plant Equipment

ALMOST from the start of the concrete aggregate business there has been a demand for a "complete" mixture, that is fine and coarse in the proper proportions for mixing with cement to make concrete. In some ways it was a reasonable request. The contractor or builder who was putting the concrete in place was usually cramped for space and buying fine and coarse aggregate separately meant two stockpiles in the place of one. Then there was the advantage of measuring a single unit of the mix instead of two. Where the work was left to the unskilled laborer, as it often was, he could be trusted to use a certain number of wheelbarrows or measuring boxes with so many sacks of cement, but he could not be trusted to make a proportion of fine and coarse in wheelbarrows or boxes, especially if the proportion was changed in the progress of the work.

Mixed aggregate, known by a dozen different names, from "concrete mix" to "succotash," has not been altogether a success because transporting and handling caused segregation of the fine and coarse material. Everyone who has seen a car of mixed material unloaded and placed in a pile has noted how the coarse pieces would roll down the pile and collect in a ring around the bottom. As the pile was shovelled into the finer particles above sifted through the coarser pieces in the pile. With this double segregation going on it is easy to see that no two batches taken from a stockpile would contain quite the same proportion of fine and coarse. So the delivery of concrete mix in gross has been replaced in great part by the delivery of proportioned mix in batches.

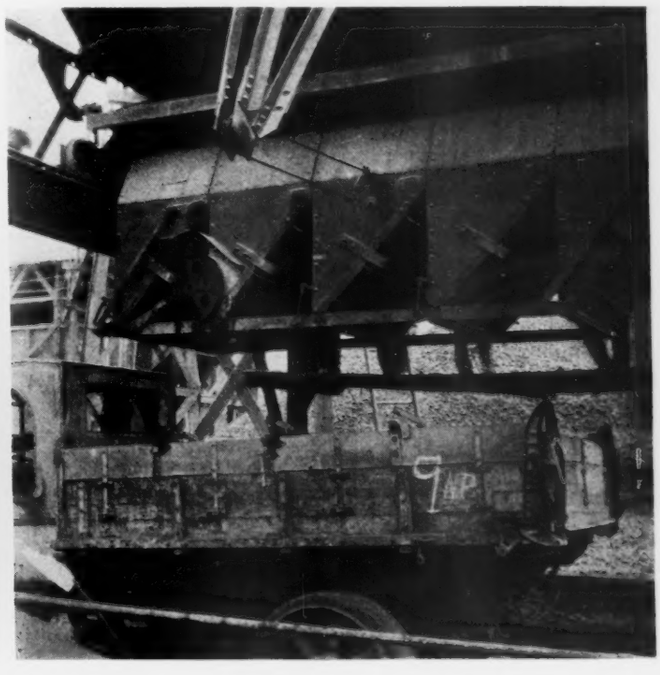
State highway engineers and builders were among the first to recognize the bad points of concrete mixtures and to insist on definite proportions of coarse and fine. Several states adopted some such specification as this:

"Sand and stone shall be measured accurately at a proportioning plant by volume at the place of loading, and in an improved measuring device, and in such proportions so as to give the greatest density and strength. Aggregates shall not be stocked in small piles on the subgrade."

The earlier measuring devices were mostly "home-made." A common form was a pyramid with an upper gate to allow the aggregate to flow in from the bin and a lower gate to let it flow into the truck after the upper gate was closed.

Some of these devices worked pretty well but at times they failed to give definite measurements. To give certain and definite volumes it is necessary to fill through a large opening and then "strike off" to a level. And this is what the modern well-built measuring devices do and their use is now common on all sorts of jobs where concrete is to be accurately mixed. Many "batchers," as these measuring devices are called, have been put in by contractors but producers in many places have had to install them so that the batcher may now be considered a regular part of the plant equipment. This is the case in New Jersey, where a Rock Products editor noted a number of installations, two of which are shown in the accompanying pictures. One of these is a Blaw-Knox batcher at the plant of the Bennett Gravel Co., at Farmingdale, and the other is an Erie "Aggremeter" at the Commonwealth Quarry Co.'s plant near Summit.

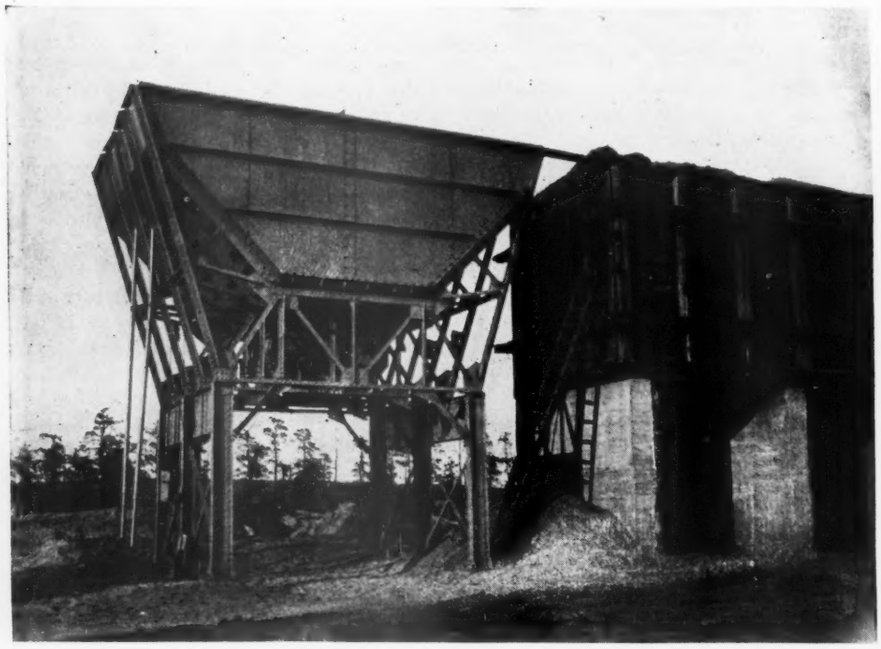
Batchers to be acceptable have to be positively filled and "struck off" at a certain level and the volume of the container in which the aggregate is measured must be capable of adjustment. The machines shown are both of types accepted by the state highway department. The writer was present at the Commonwealth quarry plant when the effect of bulking on moist sand was being studied in connection with the volume delivered by the batcher. Mr. Bonnell, the superintendent of the plant and the highway



Batcher installed at the Commonwealth Quarry Co.'s plant near Summit, N. J.

department, were making tests on bulking from which a correction factor was derived and the batcher set to give the corrected volume.

The business of making and selling concrete aggregates not only grows in importance daily but it also calls for more attention and effort to conform to the demands of the market both as to quality and method of delivery. The selling of aggregate in batches by the producer would seem to be a natural development of the business.



Batcher installed by the Bennett Gravel Co. at its plant near Farmingdale, N. J.

Why Tonnage Basis Is Best

For Buying and Selling Sand and Gravel

By T. H. Walton, Jr.
Stewart Sand Co., Kansas City, Mo.

IN response to a number of inquiries, we have conducted a series of tests to determine the amount of loss to the customer when buying sand on rainy days, first; when buying sand by the ton; second, when buying by the cubic yard.

We have made daily tests for several weeks, under all possible conditions, to determine the following facts: We have found that sand (1 ft. from surface of pile) will contain a minimum of 50 lb. of moisture to the ton regardless of the period between rains. Also that sand in a pile will never contain more than 100 lb. of moisture to the ton. After this point is reached rain will run off as fast as it falls. Thus it can be seen that the greatest possible loss per ton to the customer on account of additional weight of the sand in rainy weather is 50 lb. to the ton which is 2½%.

However, we have found that sand rarely dries enough to contain only 50 lb. of moisture to the ton. Several tests made on sand that had dried from two days to a week showed 60 lb. of moisture to the ton. Tests made during a light rain and two to four hours after a heavy rain showed a moisture content of 90 lb. to the ton. Under these conditions we find the average amount of extra water delivered to our customer will not be more than 30 lb. to the ton or 1½%.

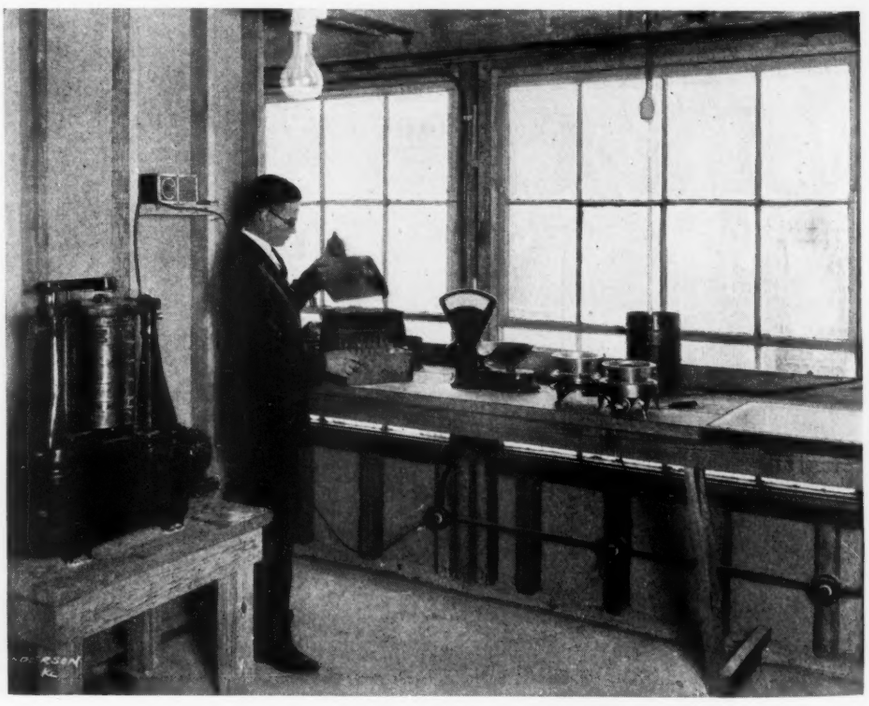
Every contractor or foreman on a concrete job has observed that moisture in sand caused it to bulk or increase in volume. At the same time it was no doubt observed that proportions which gave concrete of the desired workability one day with one lot of aggregates, gave concrete that was harsh and difficult to handle another day. This can easily be traced to the "bulking" of sand.

Sands which run from dry sand to sand containing 5% of moisture, will have increasingly greater bulk so that the same number of grains of sand which fill a one cubic yard of measure when absolutely dry will occupy 37 cu. ft. instead of 29, when containing 5% moisture.

Our tests have shown that sand in a pile contains 90 to 100 lb. of water to the ton on wet days. This amount of water in the sand will cause it to bulk the maximum amount. When the moisture content of one ton of sand is increased from 50 lb. (the minimum amount found in sand) to 100 lb. (the maximum amount), the sand will occupy one-tenth more space.

From the above it is evident that the sand customer not only does not lose anything on wet days when buying sand by weight as compared to measure but actually gains. The greatest possible loss when buying by weight is 2½% of the load and the loss when buying by measure is 10% of the load, a difference of 7½% of the total amount purchased.

Sand measured by weight gives as nearly as is practical a uniform amount of dry sand under all conditions. When sold by the yard there will be a considerable variation in the actual amount of dry sand in each load. For this reason as you know we have placed all our sales on a tonnage basis.



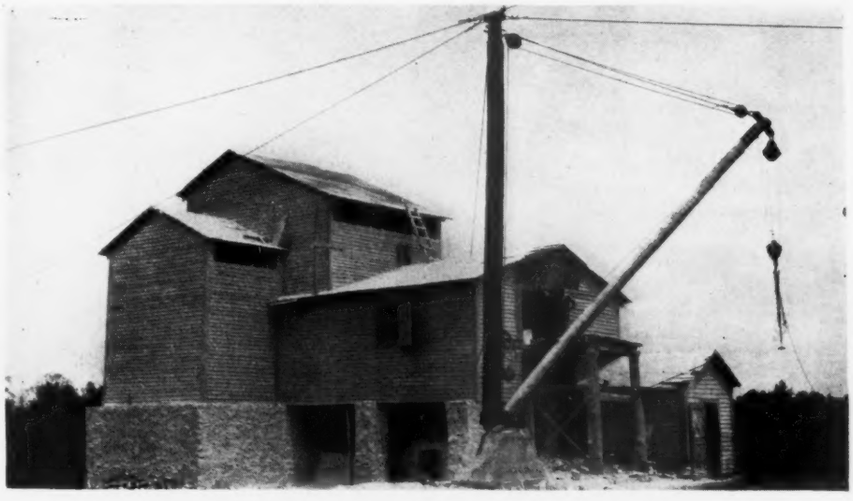
Sand laboratory of the Stewart Sand Co., Kansas City, Mo.

Where Crushed Stone Is a By-Product

Small But Efficient Plants That Work Up the Wastes of Stone Cutting at Lithonia, Georgia

THE town of Lithonia, which is 25 miles out of Atlanta, Ga., is the center of a considerable granite quarrying industry. There are three companies working there, the Arabian Crushed Granite Co., the Pine Mountain Granite Co., and the Davidson Granite Co. Unfortunately, train schedules permitted a visit to only the first two named.

Practice in this district is said to vary from that of every other quarrying district in the world, especially in the method used to open the quarry. This is called "lifting the stone," and it is said to have been discovered by accident. However that may be, it is a most remarkable example of what may be done by working with the forces of nature, and it is probable that no other operation of the kind can show so large a result for so slight an expenditure of labor and explosives.



Crushing plant of the Pine Mountain Granite Co.

To understand this operation, one must know that this granite splits very easily along two planes, which local quarrymen call the "reft" and the run. The "reft" is almost horizontal, and the "run" is on a vertical plane which, curiously enough, runs almost exactly north and south. Some say that it does lie along the true meridian, while others claim that there is a slight variation.

The "reft" is the plane taken advantage of in "lifting the stone." A 3-in. hole is put down with a tripod drill at about the center of the patch it is desired to lift. The depth of this hole is from 10 to 12 ft. A small charge of black powder, never more than a tea cup full, and usually less, is placed in the bottom of the hole and tightly tamped. It is fired with an electric battery. Nothing particularly appears to have happened as the result of this little shot, for the stone is not shattered in the least. But a cleavage has begun to start outwardly along the "reft," horizontally from the bottom of the hole. The cleavage is helped along by firing more of the little charges and by connecting an air hose to a pipe which is tightly wedged in the hole. These have some effect but probably the greatest effect of all is the result of unequal expansion of the rock. The opening of the quarry and lifting of the stone is always undertaken in the spring and early summer months, when the rock is beginning to warm up after the winter's cold. Naturally the surface warms first and expands more than the rock below. This unequal expansion puts the rock under a strain so that the light blows from the small charges of powder and the pressure from the air hose are enough to start the cleavage along the "reft" and the sun does the rest.

In the course of a short time a slab of granite like a gigantic pancake, 8 to 10 ft. thick, and some 200 or 300 ft. in diameter, perhaps, becomes detached from the rock and lies ready to be cut up in blocks. This is done by taking advantage of the "run." The slab is split on the "run" by the ordinary "plug and feather" method (wedges driven between two little plates or "feathers"), the holes for which are drilled by small air drills of the "plugger" type.

The rock splits so easily on the "run" that the results are almost incredible to one who is not familiar with the work. It is actually cheaper to split off big cubes and then cut them down to make crusher feed by splitting than it is to shoot them with powder.

Paving Blocks and Curbing Chief Products

The rock is a fine-grained light-colored granite and the reader, wherever he may live in the United States, has probably seen some of it, for it is shipped to most of the large cities either as paving blocks or curbing. The writer was shown shipments being made up for New York, Chicago, Philadelphia, Cleveland, Cincinnati and New Orleans, and was told of a dozen more cities to which shipments are regularly made.

The making of paving blocks and curbing

Crushing plant of the Arabian Crushed Granite Co.

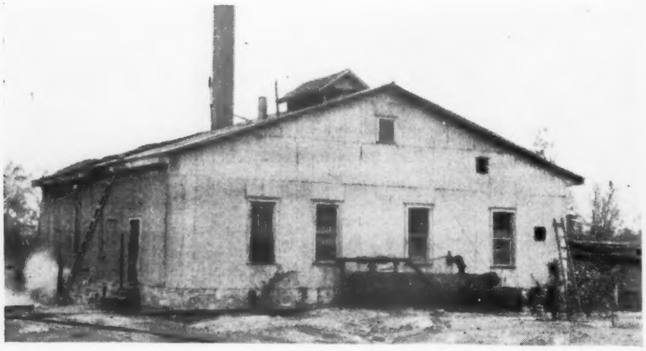
is a skilled trade, the workmen being Scotchmen, Welshmen, or Swedes. It is interesting but a description does not properly belong in ROCK PRODUCTS. The interest in these quarries for the readers of this paper will lie rather in the crushing plants in which the quarry waste, such as the spalls from cutting, are worked into commercial sizes of crushed stone for various purposes.

The two plants visited are alike in having the same flow sheet and a similar method of operation. Both have only a single crusher, a No. 6 Good Roads Champion jaw crusher being used in the Arabian and a McCully gyratory, which will take 8-in. cubes, being used at the Pine Mountain. In both plants the feed is brought to the crusher in boxes which lie on the bed of a truck or a wagon. The box with its contents is lifted to a platform above the crusher by a derrick and dumped on the platform. After passing the crusher the rock goes to a screen which has 2½, 1¾, and ¾-in. openings. A Good Roads screen is used in the Arabian plant and an Austin screen in the Pine Mountain plant. There is a dust jacket with ½-in. openings, the product of which is called "sand." The oversize of the screen returns by gravity to the crusher and stays in the circuit until it is fine enough to pass the screen.

It was difficult to find a market for this "sand" as of course it has no value for agricultural purposes, as crushed limestone would have, and it was not much wanted to take the place of natural sand in making concrete. But recently small screens have been installed to separate this dust into several sizes and these sized products are sold for making a "pebble dash" finish with stucco and for other plaster finishes, thus solving a problem which had begun to be somewhat pressing.

Compressed air is used for power in both plants. The Pine Mountain Co. has electric power and uses it to run two Sullivan air compressors of the angle type, each of which will furnish 1200 cu. ft. of air per minute. The primary use of these compressors is to

Left—The stone brought in from the quarry is lifted in the wagon bed to the platform above the crusher. Right—The wagon bed swinging free from the wagon



Left—Compressor house at the Arabian quarry. Right—The bins of the Pine Mountain plant which are of solid granite masonry

Left—A screen used for separating the granite sand into pebble dash material. Right—F. C. Mason and John Taylor

One of the cutting sheds in which the granite is cut to make curbs and paving blocks. The chips from this operation go to the crusher

furnish air to the drills and rock facing machines, but connections are made to the two engines at the crushing plant and the air is to be used in them as steam would be.

At the Arabian plant there is a big steam-driven Sullivan compressor, with Corliss valve gear on the steam end which has been in service for 14 years and bids fair to run another term of equal length. This likewise furnishes air to both drills and the engine at the crushing plant. Preheating the air is practiced, but in a very rough way, wood fires being built on the pipe line near the engine. A regular preheater would undoubtedly save a considerable amount of air, since preheating is one of the most efficient methods of changing heat into mechanical energy that has been discovered.

Well-Built Crushing Plants

Although crushing rock is only a kind of side show at these quarries one is struck by the neatness of the plants and the workmanlike way in which the whole operation is carried on. The Pine Mountain plant is especially well constructed, the foundations and the lower part of the bins being built of granite block masonry. This kind of masonry is used to a considerable extent in the buildings of both plants, as would be expected.

Although the rock is so docile when it is split by skilled workmen it is exceedingly hard and resists the weather indefinitely. The walls of the powder house at the Arabian plant have been standing for 11 years and the faces of the blocks look as fresh and clean as though they were put in the wall a day or two ago.

Fred C. Mason of Atlanta is president and manager of the Arabian company. John Taylor is in charge of the quarry operation. Mr. Taylor is a Scotchman who has seen much of quarry work on both sides of the Atlantic.

F. R. Mason, brother of F. C. Mason, is president of the Pine Mountain Co., Robert Underwood is secretary, and Alexander Kelley is superintendent and manager. Mr. Kelley was formerly in charge of a quarry at Sandstone, Minn., and is well known to the quarry industry in the Middle West.

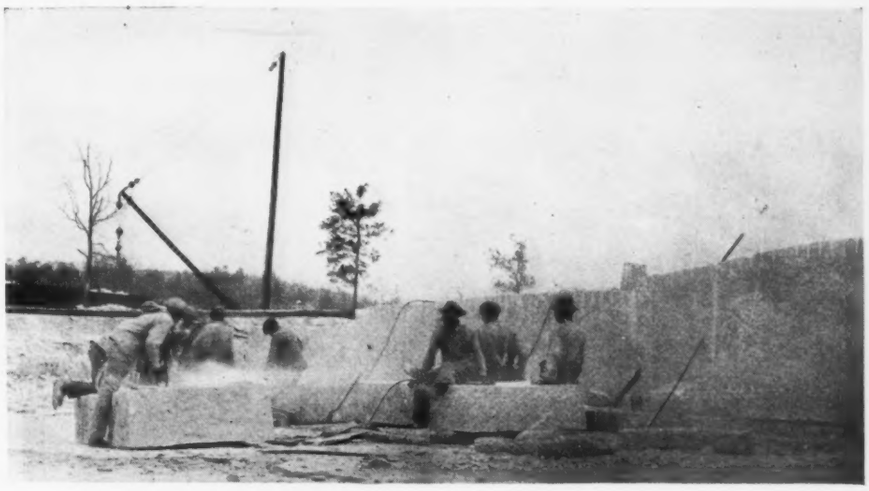
J. W. Vorhis in Charge of Quincy, Ill., Quarry Operations

THE Quincy Municipal Quarry, Quincy, Ill., now being operated by Bauer-Johnson and Co., contractors of Omaha, Neb., and under the direct supervision and management of J. W. Vorhis, shown in accompanying photo, is taking on the proportions of an efficient and well balanced operation. Standard quarry equipment is being installed, a new Northwest gasoline shovel and an Armstrong well drill being the most recent additions. The operation is a combined tunnel and open ledge operation.

Mr. Vorhis very successfully executed a difficult ledge shot a few weeks ago, it being the first one ever attempted at this operation, as heretofore it was considered impossible due to the proximity of plant buildings, a highway and the character of ledge. Approximately 15,000 tons of stone were produced by the shot.

Production all goes to two asphalt plants owned and operated by the Bauer-Johnson and Co. interests, who have a very extensive paving contract for the city of Quincy.

J. W. Vorhis, Quincy, Ill., operating municipal quarry under contract



Breaking blocks by "plug and feather" work, which is a cheaper way than blasting to produce crusher feed from this stone. Note the smooth clean face of the quarry at the right

Poultry Grit—Quarry Byproduct

An Analysis of the Grit Requirements and an Estimate of the Market Possibilities

By Cary A. Rowland
Flushing, L. I., N. Y.

POULTRY GRIT as a commercial product is comparatively new. The farm flock of a generation ago rustled for its grit, very much as it rustled for most of its feed, but the last decade has seen vast changes in the poultry industry.

The perfection of mammoth incubators, coal-burning brooders and the shipping of millions of chicks by parcel post—these developments have made possible an amazing expansion. Flocks averaging several hundred may now be found in almost any prosperous farming community, and in the specialized poultry sections of New Jersey and California flocks range from 1000 to 10,000 birds. Moreover, backyard poultry-keeping has developed as an important side-line and advocation. Flocks kept under such intensive conditions must be supplied with practically everything they consume, including poultry grit.

To understand the market for poultry grit it is necessary to consider the function of poultry grit in the ration.

Since hens have no teeth, grit is essential to supply the gizzards with grinding material. For this purpose, the chemical composition of the grit is of no importance, so long as the grit is hard, sharp and durable. Quartz makes an ideal grinding grit.

But quartz alone will not suffice, because laying hens require far more calcium carbonate than can be assimilated from the ration. Experiments have been tried to test the practicability of adding a limestone dust to the mash consumed by the birds, but not enough can be added to meet the requirements of laying hens.

Nearly one-third of the total dry matter in an egg consists of calcium carbonate, most in the shell. The ordinary feed and water which the hen consumes will supply only 15% of the calcium carbonate needed for the shell alone, to say nothing of the other bodily requirements.

It is therefore necessary that lime be fed in the form of grit. This may be done through the use of broken oyster shells or of limestone grit containing a high percentage of calcium carbonate.

A shipment of live chicks—a recent development

An "ultimate consumer" of poultry grit

The lime and grit requirements of a flock may be met in several days. Quartz grit may be fed along with oyster shells; limestone grit may be fed alone, or limestone grit may be fed along with oyster shells.

Efficiencies of Various Kinds of Grit

Experiments to determine the relative efficiency of the various forms of grit have been carried out at the Wisconsin and Ohio experiment stations. It was found in both cases that the relative value of limestone grit was about 71% that of oyster shells as a source of calcium carbonate. This is doubtless due to the more porous nature of the oyster shells which permit the digestive juices to penetrate.

It is a matter of common observation that hens will eat oyster shells more freely than either of the other forms of grit. Yet oyster shells alone will not suffice because there is need for a less soluble grinding substance. The writer uses a mixture of limestone grit and oyster shells and finds it very satisfactory.

What is the practical value of all this to the quarryman? That there is a large and growing market for both quartz and limestone grits. Whether it will pay to install special machinery for cleaning and grading the grit is a matter which must be decided in the light of the particular conditions.

Extent of Market

The extent of this market may be glimpsed from these figures: In 1920, the U. S. Census showed a chicken population of 395,000,000. The estimated increase since that time is about 25%, making the present chicken population about 500,000,000 mature birds. In addition, there are several hundred million youngsters during the growing months.

Dr. B. F. Kaupp at the North Carolina Experiment Station conducted tests with two flocks of commercial size. These flocks contained 500 pullets and

500 hens respectively. The 500 pullets consumed in one year 1395 lb. of grit and oyster shells combined. The hens consumed exactly 1300 lb.

From these figures it may be safely assumed that mature birds consume from 2½ to 2¾ lb. per year of grit of all kinds. The lower figure would give us a potential market of 625,000 short tons for grit, including oyster shells. Beside this figure the known tonnage for limestone grit, 13,180 tons in 1925, is insignificant. The tonnage of granite grit is concealed in the government reports under "Other Uses." Making allowance for the tonnage of oyster shells, there is evidently still plenty of room for expansion in the grit industry.

Preparation of Grit

Poultry grit is screened into three sizes—coarse, medium and fine for grown hens, growing stock and baby chicks respectively. By far the most important size is the coarse grit. This, according to the Kentucky Experiment Station, should pass through a ¼-in. mesh. All dust should be removed by passing over a fine screen. A percentage of fairly small particles is not a serious objection. Poultry grit is almost invariably sold in 100-lb. burlap sacks.

Poultry grit is usually distributed through jobbers of poultry supplies. From them it passes to retail dealers of various classes—specialty poultry supply houses, feed dealers and general country stores. In some sections it would doubtless be possible to make contracts with co-operative groups of poultrymen direct.

Distribution—Advertising

Several producers have advertised quite extensively to establish their brands. In the opinion of one of the leading poultry paper publishers, this advertising is in danger of being overdone. Grit constitutes a comparatively small item in the poultryman's budget, scarcely more than 1% of his outlay for feed. For this reason any advertising undertaken must be planned with a strict eye to economy.

The writer believes that the most economical advertising would be a co-operative campaign to be undertaken by a group of plants producing grit of similar character.

Kind of Stone Required

A word may be in order concerning the quality of stone suitable for grit. So far as granite is concerned analysis is not important. There is a preference for granite grit containing a high percentage of mica on the theory that such grit is more attractive to the hens. There seems, however, to be little real basis for any such notion as modern grit is served in hoppers, readily available to the entire flock.

In the case of the limestone "two-in-one" grits, analysis assumes greater importance. The best grades contain a high percentage of calcium carbonate—90% or better.

An interesting problem arises in the case of the dolomites. Can magnesium carbonate be substituted in part for calcium carbonate, as may be done with agricultural limestone?

Poultry investigators at the experiment stations are unanimous in declaring that this cannot be done. Magnesium carbonate will not injure the birds, but it has no practical value in either shell or body building. For this reason, limestone producers whose rock is of a dolomitic nature will do well to leave the poultry grit market to those having rock which averages at least 90% calcium carbonate.

The market for poutry grit may be expected to expand steadily, even rapidly. Modern methods are being increasingly applied to existing flocks and new flocks are constantly being established. It seems

Modern poultry methods provide no opportunity for the hens and chickens to find their own grits

reasonable to expect that the co-operative poultry exchange will be a factor of increasing importance in distribution. And it may be safely assumed that the co-operatives will buy more on the basis of analysis and price than on that of brand.

EDITOR'S NOTE—The Centerville Gypsum Co., Centerville, Iowa, has been very successful in producing and marketing gypsum poultry grits. The gypsum is equally (or even more) efficient to limestone as a source of calcium for egg-shells. The anhydrite may be used for this purpose.

New Quarry Section of National Safety Council

MEMBERS of the National Safety Council who are in the quarry industry have formed a special section which will issue a news letter for the edification of not only each other but which will also go to the various trade associations. It is the feeling of the organizers that there is a big field in the crushed stone, crushed slag, slate and quarrying of all kinds of stone for more intensive work to prevent accidents.

The newly elected officers are: E. E. Evans, of the Whitehouse Stone Co., Toledo, chairman, and Don C. Souder, of the France Stone Co., Toledo, secretary. They are arranging a program for two sessions to be held during the National Safety Congress which will be held at Cleveland this September and will cooperate with the Cement Section of the National Safety Council.

Meetings already have been held in Toledo, in May and April, when preliminary plans for the new section were discussed.

Those people in the quarry industry who now belong to the National Safety Council have found that the service received from that non-profit making, cooperative institution has enabled them to reduce their accidents and save considerable money on workmen's compensation insurance rates.

Bureau of Mines Transferred to Department of Commerce

IN the interest of more efficient co-ordination of government work on mineral satistics, President Coolege has transferred the Bureau of Mines and the Division of Mineral Resources of the U. S. Geological Survey from the Department of Interior to the Department of Commerce. The work of the Division of Mineral Resources will be continued, with little or no change of personnel or policy, by a division of the Bureau of Mines.

Although this phase of the Geological Survey now ceases, the survey will keep in touch with the mineral industry through its geological investigations, and continue to serve the industry in any way possible.

New Invention May Effect Raw-Grind of Cement

A NEW machine which may affect the portland cement industry is the "superthickener" which has been developed by A. L. Bloomfield, manager of the Golden Cycle Mining and Reduction Co., Colorado Springs, Colo. The original inventor was H. S. Coe and a very full description is published in the current *Engineering and Mining Journal Press.*

It has long been suspected that the present method of grinding the raw materials of cement to a slurry is inefficient as compared with tube mill practice in the fine grinding of ores and some other rock products. In grinding cement slurry the moisture is kept very low and the material given only one pass through the mill. Particles insufficiently ground cannot be separated from such a thick pulp either by screening or hydraulic classification.

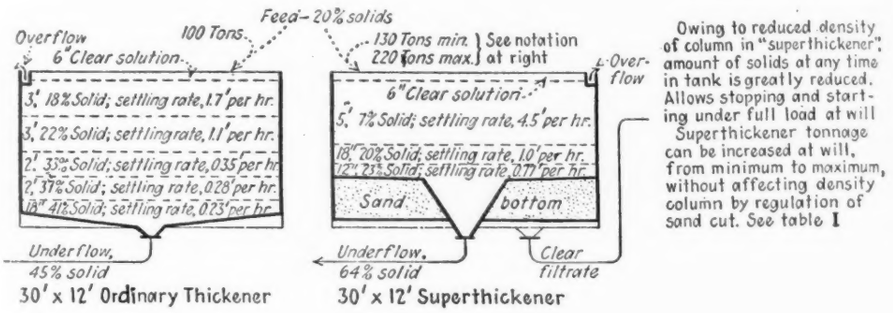
In the other practice referred to, a thick pulp is ground in the mill, but the discharge of the mill is diluted and such particles as have not been sufficiently ground are separated either by a scren or some form of hydraulic classifier. This leaves the sufficiently ground particles in a very thin pulp. To get rid of the excess moisture this pulp is passed through Dorr thickeners and in some cases it is further dewatered by vacuum filters. The methods are efficient but expensive. For cement practice it has been thought better to adhere to a single pass through the mill, keeping the pulp all the time at a low moisture content rather than to install the expensive thickeners and filters.

The new "superthickener" both thickens and filters. The filtering medium is a bed of sand which is kept clean by being continually cut away by the arms of the thickener. By this combination of filtering and thickening, pulps as dry as 80% solids have been made. Such a pulp compares favorably in moisture content with the cement slurry made by the ordinary method of grinding a low moisture pulp.

As to the saving that could be made by grinding slurry with a return of the particles not sufficiently ground and overflowing the sufficiently ground particles by a classifier, there are no figures of which ROCK PRODUCTS knows that are available, although there has been considerable experimenting to determine what the saving would be. The information from one such experiment was that the capacity of a tube mill would be increased between three and four times for the same horsepower. In the light of experience in grinding other substances with tube mills this does not seem unreasonable.

There remains the contamination of the slurry by sand which may come from the filter bed to be considered if this new "superthickener" is used. This cannot be much when only ⅛-in. of sand is scraped off in 24 hours while the thickener is handling 130 tons of solids. It is about 0.03% if the sand weighs 100 lb. to the cu. ft.

In view of the many experiments that have been made to increase the efficiency of the raw grind of cement materials, this new machine has interesting possibilities.


Overflow
6" Clear solution
100 Tons
Feed—20% solids
130 Tons min.
220 Tons max.
See notation at right
Over-flow
3', 18% Solid; settling rate, 1.7' per hr.
3', 22% Solid; settling rate, 1.1' per hr.
2', 33⅓% Solid; settling rate, 0.35 per hr.
2', 37½% Solid; settling rate, 0.28" per hr.
18" 41% Solid; settling rate, 0.23" per hr.
Underflow, 45% solid
30' x 12' Ordinary Thickener
6" Clear solution
5', 7% Solid; settling rate, 4.5' per hr.
18", 20% Solid; settling rate, 1.0" per hr.
12", 23½% Solid; settling rate, 0.77" per hr.
Sand
bottom
Underflow, 64% solid
Clear filtrate
30' x 12' Superthickener
Owing to reduced density of column in "superthickener", amount of solids at any time in tank is greatly reduced. Allows stopping and starting under full load at will
Superthickener tonnage can be increased at will, from minimum to maximum, without affecting density column by regulation of sand cut. See table I

"Superthickner" invented by a mining engineer may affect wet-process cement manufacturing methods

TABLE I

Tonnage handled by ordinary thickener, 100%.
Solid content of underflow, 45%.

Superthickener

Solid content of underflow, 64%.

Depth of sand cut per 24 hours	Tonnage handled, that of ordinary thickener in parallel equaling
	100%
⅛ in.	130%
¼ in.	150%
½ in.	195%
1 in.	218%
2 in.	225%

Table I referred to in accompanying diagram.

A Correction

IN an editorial on "Dolomite Possibilities" in the May 16 issue of ROCK PRODUCTS, we referred to the work being done on dolomite refractories at Ohio State University. This research work should have been credited to the U. S. Bureau of Mines Experiment Station on the campus of Ohio State University, of which G. A. Bole is superintendent.

Theory and Practice of Lime Manufacture*

Part I—Heat Distribution in a Theoretical Lime Kiln— Kiln Efficiency Rating — Amount of Heat Required

By Victor J. Azbe
Consulting Combustion Engineer, St. Louis, Mo.

LIME-KILN efficiency is practically an unknown quantity because of a lack of knowledge of the fundamentals which enter into the problem. This installment of the series of articles based on my paper before the National Lime Association on May 25, 1925, will cover some of these fundamentals. Subsequent articles will cover the effects of too little and too much air, incomplete combustion, heat losses, kiln-gas analyses and their uses, a comparison of kiln designs, kiln-operating practice, kiln efficiencies actually found in practice and some reasons for these low efficiencies.

Heat Distribution in Theoretical Kiln

The judging of a lime kiln, can be done by either comparing its performance with other kilns or by comparing it with an ideal. For best results, one should do both. An ideal kiln will burn fuel with a theoretically correct amount of air, that is, incomplete combustion will not take place and there will be no excess air. The lime and gas travel will be such that counter-current heat flow transfer will be in effect. The stone outer surface will begin to be converted to lime at a temperature of about 1400 deg. F. and the inner portions will be decomposed at a temperature of 1650 deg. F. All sensible heat in the burned lime will be retrieved and used for preheating of air, used for combustion. In the calculations to follow, a temperature elevation of only 200 deg. F. will be allowed for heat transfer which means that the gaseous products of combustion and CO_2 driven from the stone will leave the burning zone and enter the preheating zone at a temperature of 1600 deg.

To decompose one pound of $CaCO_3$ into CaO and CO_2 there are 772 B.t.u. required or 1378 B.t.u. per pound of CaO.

If we burn coal having a heating value of 12,780 B.t.u. per pound, the gaseous products of combustion will weigh about 10.40 pounds per pound of coal.

If we further assume that lime leaving the burning zone will be at a temperature of 1650 deg. F. (actually it is considerably more) and its specific heat is 0.22, then the sensible heat content of each pound of lime passing into the cooler above the temperature it enters the preheater will be 350 B.t.u.

Of the heat in the coal, provided there was no loss by radiation in the furnace and no loss due to the carbon in ash, all will be available for making lime, except that in the products of combustion at the temperature of 1600 deg. F. when some are leaving the burning zone, and that carried off by lime into the cooler above the decomposition temperature. Heat capacity of the products of combustion at this temperature is 4250 B.t.u., or 33.2% which is not available for lime burning. This figure divided by 1378 B.t.u. required for decomposing 1.785 lb. of $CaCO_3$ equivalent to one pound of CaO gives us a ratio under these conditions of 6.19 tons of lime per ton of coal.

This amount is slightly increased by the CO_2 gas which will be evolved at the temperature of 1650 deg. F. and which will cool and leave the burning zone at a temperature of 1600 deg. F., the difference being used in making lime. The actual amount of this heat cannot be determined and since it is small, it will be ignored.

One pound of CaO represents 0.785 lb. of CO_2 gas given off in the decomposition zone. The 6.19 lb. of CaO therefore represents 4.85 lb. of CO_2 gas and so the total weight both of the gaseous products of combustion and the CO_2 from limestone is 15.26 lb. The products of combustion contain at 1600 deg. F. as stated previously 4250 B.t.u. and the CO_2 from limestone will contain $419.34 \times 4.85 = 2070$ B.t.u., or the two together will contain 6320 B.t.u. which is available for preheating of the stone.

For 6.19 lb. of CaO there are 11.05 pounds of $CaCO_3$ required and assuming that the stone is pure and dry, this amount will have to be preheated, a part up to 1400 deg. F., and a part to 1650 deg. F. before decomposition will begin. Assuming that the specific heat of $CaCO_3$ is 0.22 and initial temperature is 62 deg. F., and the stone is heated to 1600 deg. F., then the amount of heat required for preheating is 3721 B.t.u., 2609 B.t.u. less than is available in the waste gases.

Next, supposing we assume that all the heat above 62 deg. F. contained in the lime leaving the cooler is retrieved and used for preheating air without loss by radiation, then the amount of heat available for lime burning proper will be increased by 2400 B.t.u. and the ratio will become 7.93 to 1 instead of 6.19 to 1.

Under these new conditions, the amount of gas leaving the burning zone will be 16.64 lb., its heat content at 1600 deg. F. will be 6700 B.t.u. The amount of heat necessary for preheating $CaCO_3$ will be 4850 B.t.u., still sufficient for the theoretical cycle.

Under conditions when sensible heat of lime is not retrieved, the waste gases will contain 45.2% CO_2 by volume. When the sensible heat is retrieved, the CO_2 percentage will be 50%.

Tabulating these results we get Table 1.

It will be noted that even calculation will not permit us to obtain 100% efficiency from a conventional kiln. This is due to the location of decomposition level, and so there

*From a paper read before the National Lime Association Convention, May 28, 1925.

EDITORS' NOTE

THE author's paper entitled "Factors Governing Lime Kiln Capacities and Fuel Economy" read (in the form of a brief abstract before the National Lime Association) is a great deal more than its title signifies. It is unquestionably the most thorough-going study of the theory and practice of lime manufacture in shaft kilns that has ever been made in the United States, if not in the world.

The paper in its original form is far too long to publish in one issue of Rock Products *and it is far too important not to be absorbed by practical lime-plant men.*

Much the reader will find in these articles which does not agree with current practice and long conceived ideas. Mr. Azbe, in his original introduction, modestly pleads his own lack of final conclusions on many of these points.

To be of the most value a thorough-going study of Mr. Azbe's theories and rules of procedure should be made. We are sure Mr. Azbe wants this, and that he will be glad to answer any questions from lime manufacturers through these columns.

Rock Products *also invites the experience and practice of other lime manufacturers. As the series of articles proceeds we will also supplement Mr. Azbe's paper with explanatory notes of our own.*

—The Editors.

TABLE I—THE FACTORS TO BE CONSIDERED IN DETERMINING LIME-KILN EFFICIENCIES

CONDITIONS: High calcium limestone—Pure—Dry. No heat loss by radiation. No excess air for burning of fuel. Complete combustion. Temperature of gas at boundary of preheating and burning zones 1600 deg. F. Coal, bituminous 12,780 B.t.u. per pound.

		SENSIBLE HEAT IN CaO AND WASTE GAS	
	Neither Retrieved	CaO Heat Retrieved Only	Both Retrieved
Weight of products of combustion 1 lb. coal	10.40	10.40	10.40 lbs.
Weight of CO_2 from limestone	4.86	6.24	7.28 lbs.
Total weight of gas leaving kiln top per pound of coal	15.26	16.64	17.68 lbs.
Amount of heat obtained for lime burning from coal direct	8530	8530	8530 B.t.u.
Amount of heat obtained from cooling CaO and preheating air	——	2400	3240 B.t.u.
Amount of heat obtained from waste gas and preheating air	——	——	1010 B.t.u.
Total amount of heat available for lime burning	8530	10930	12780 B.t.u.
Heat lost to cooler as sensible heat in CaO	2165	——	—— B.t.u.
Heat lost in waste gas leaving kiln top	2609	1850	—— B.t.u.
Ratio tons of lime per ton of coal	6.19	7.93	9.27 To 1
Heat used per pound of lime made	2075	1620	1378 B.t.u.
Kiln efficiency	62%	85.5%	100%
CO_2 percentage in waste gas by volume	45.2%	50%	53%

is more heat available for preheating of stone than is necessary. It further will be noted that some of the heat used for preheating stone, that in the CO_2 portion of the stone, becomes again available for preheating other stone after the CO_2 is driven off and passes up through the preheating zone. Of the heat obtained from the cooler, all becomes available for decomposition of stone.

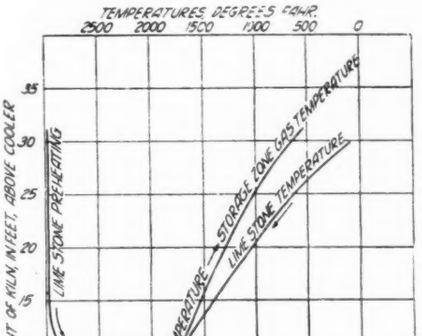
Kiln Efficiency Rating

Boiler performance is always gauged in terms of efficiency and the figure pounds of water evaporated per pound of coal means very little since evidently not only the boiler itself but also the quality of coal determines that. In the case of a lime kiln, the ratio tons of lime per ton of coal means very little since here also coal has a great deal to do with it. To gauge kilns in terms of efficiency, the same as boilers, is difficult because the kiln is much more complicated and really consists of four different parts while boilers as a rule consist of only two. The kiln has a coal grate or gas burner, it has a cooler, a decomposition zone and a preheating zone.

If the grate or burner performance is poor, the best of kilns will not give good results and evidently the performance of the two should be distinguished from each other. Inefficiency, caused by insufficient amount of heat generated or heat delivery in improper form, certainly is chargeable to this apparatus and not to the kiln. The cooling zone of the kiln should act as an air preheater, for as a preheater it is far more important than it is as a lime cooler. But principally due to various difficulties it is seldom so utilized.

The most important zone of the kiln is the burning zone. Here all heat of high temperature elevation, that is, from around 1600 deg. F. up, is utilized. This zone cannot utilize heat below this level no matter how much heat at this temperature is furnished to it. If the coal grate or burner delivers heat of low temperature elevation, caused by excess air, radiation or incomplete combustion, evidently the burning zone cannot perform right even if it is of an efficient design.

The function of the preheating zone is



Theoretical lime kiln and decomposition of calcium carbonate

B.t.u.'s

WHEN a definite quantity of coal is burned a definite quantity of heat is produced. Coal is measured in pounds; heat, in British thermal units (B.t.u.). A B.t.u. is the amount of heat required to raise the temperature of one pound of water one degree Fahrenheit. One pound of ordinary bituminous coal contains in the neighborhood of 12,000 B.t.u.

in part rock storage but mainly a zone where the heat exchange between the cooling gases and the heating lime takes place. Here, as well as in the burning zone, the hot gas flow distribution may not be right or stone may not travel down in proper sequence and the performance of the entire kiln may be upset and poor results obtained even if the other zones may perform their duty.

Amount of Heat Required

Due to this, each zone should be judged on its own account, but that is not fully possible; so evidently an expression covering all four must be developed. Before this can be done, one must know how much heat there is required to make a pound of lime and that is a knotty problem. The heat required to decompose a pound of stone, we, of course, know and we can also determine how much heat is required to preheat the stone up to calcining temperature but during decomposition, the CO_2 that escapes, carries off heat which becomes available for preheating, so in the last analysis there is not so much heat necessary for preheating as we first assumed and so a possible basis for figuring efficiency disappears.

If it was possible to operate a kiln with a cold top and a cold bottom, that is, have the waste gases and the finished lime leaving at the temperature of entering air, then the efficiency could be based upon only the heat of decomposition of limestone, but while a cold bottom is possible in the theoretically ideal kiln, even this kiln will not give a cold top, and efficiency certainly should not be based upon something that is theoretically impossible.

If in the theoretically ideal kiln we would preheat only part of the air with the lime in the cooler and preheat the other air used for combustion with an economizer located beyond the preheating zone, then a cold top and cold bottom condition will result. The kiln efficiency could then be based on heat required to decompose $CaCO_3$ or $MgCO_3$ without any consideration of the amount of heat necessary for preheating. The amount of heat required for decomposing $CaCO_3$ for one pound of CaO is 1378 B.t.u. and $MgCO_3$ for one pound of MgO is 977 B.t.u. Kiln efficiency determining formula then becomes:

$$100\,\frac{1378\,C + 977\,M}{H} = E$$

C=Number of pounds of CaO per pound of coal.

M=Number of pounds of MgO per pound of coal.

H=Heat value in B.t.u. per pound of coal.

E=Thermal kiln efficiency.

In the third column of Table 1, the conditions that would be obtained in an ideal theoretical installation are given. In this case, all lime is cooled at atmospheric temperature by part of the air later used for combustion, while part of the air passes through an air heated by waste gases leaving the kiln top.

This, of course, is all theoretical and is given to show heat distribution. Practically, it is doubtful, if one could operate satisfactorily under the last ideal conditions because the air would be preheated to such an extent that furnace temperatures would be entirely too high for the manufacture of good lime.

(To be continued)

American Society for Testing Materials Holds Annual Convention

Many Subjects Bear on Production Problems of Rock Products Producers

By Edmund Shaw
Editor, Rock Products

THERE are two meetings being held at Atlantic City, N. J., this week (June 22 to June 28) that are of considerable importance to the rock products industries. One is the annual meeting of the American Society for Testing Materials, the other that of the Gypsum Industries. Beside having a meeting of its own, the gypsum industry will have a considerable part in the program of the A. S. T. M.

It is surprising to know the importance which the rock products industries have reached in the work of the A. S. T. M. One of the older members has estimated that back in 1910 fully 90% of the society's membership was of those interested in the metallurgy and the manufacture of steel. Today he estimates that the "steel membership" will not reach 40%. Non-ferrous metals, textiles and the rock products industries make up the remaining 60%, but of these the rock products industries have by far the largest representation. It is significant as showing the ever-growing importance of rock products in our daily life and in our industries.

As this is written no sessions have been held which would particularly interest Rock Products' readers, but it may be well to call attention to some of the important papers and discussions that are to be heard later in the week.

The report of Committee C-1, on cement, will probably be received with as much interest as any, because it contains the "Manual of Cement Testing," which the committee has had in preparation for so long a time. It has been recognized by the committee that, while the standard specifications for portland cement are satisfactory enough, the results obtained by the usual methods of testing are not always sufficiently concordant. This manual gives the laboratory work, especially the manipulation, in such detail that the results of cement testing hereafter should show an improvement over what has been the case when the work of two laboratories is compared.

A paper which is bound to interest both manufacturers and users of cement in highways is that of A. T. Goldbeck, chief of tests of the Bureau of Public Roads. Mr. Goldbeck says that highway engineers are justified in saying that a cement having a higher early tensile strength than is called for by the standard specifications is desirable for highway work, provided it can be obtained economically. But he also points out that more cement or better concrete control may give the desired high early tensile strength in a more economical way than purchasing a cement of a higher standard.

A paper especially interesting to highway engineers who are working with high alumina cement is that of H. S. Mattimore, which describes the effect of different methods of curing on concrete made with such cement.

Committee C-7, on lime, is submitting some revisions of the standard specifications for structural hydrated lime and recommending tentative standards for lime for sulphite pulp and for water treatment. Tentative specifications for lime for the cooking of rags are recommended to be advanced to standard.

The Gypsum Committee, C-11, also submits revisions. These revisions apply to the standard methods of testing gypsum and gypsum products. The tentative standards for wall board and some other gypsum products are recommended to be advanced to standard. A paper on the fire resistance of gypsum partitions will be read by S. H. Ingberg.

The last session of the convention will be devoted to concrete. The report of the committee on aggregates will submit revisions on the method of sampling hardened concrete and the advancement of the tentative methods of compression testing to standard. Probably as a preliminary to specifications for the flexural and tensile methods of testing concrete a bibliography of these subjects is presented along with a brief synopsis of what various investigators of these subjects have found. A form for reporting on natural deposits of aggregates is also presented.

F. H. Jackson and George Werner will present a paper on a new device for testing the consistancy of concrete. This was briefly described in an article on the work of the Bureau of Public Roads in Rock Products for May 2, 1925, p. 68.

An important technical paper by H. F. Gonnerman will consider the effect of the size and shape of test specimens on the results of the compression test.

Prof. D. A. Abrams has a paper on the bond between concrete and steel, giving the results of a great many tests made at the Lewis Institute which, of course, is of the greatest importance to designers of reinforced concrete. There are two papers on mortars, one which considers laboratory testing methods in the broad way, by John W. Gowen and H. Walter Leavitt, and the other, especially interesting to producers of fine aggregates, on the analytical properties of set and hardened mortars, by E. E. Butterfield.

New Gypsum Plant for British Columbia

THE British Columbia Gypsum Co., Ltd., which has had for a number of years a large gypsum deposit at Falkland, B. C., on the Canadian National branch from Kamloops to Kelowna, has just purchased a site for a gypsum plant at Port Mann and will proceed to erect a plant immediately. The property has a frontage of 1110 ft. on the Fraser river.

The gypsum deposit at Falkland is the largest deposit of gypsum that is known in the province. The property at Falkland was bought about 11 years ago when the Canadian Northern Ry. proposed building the line which is now being completed.

Generally gypsum mills are built on the deposit but in this case the company considered it more advantageous to bring the rock to tidewater as there are many advantages for the operation of a plant at the coast.

The Manitoba Gypsum Co., Ltd., Winnipeg, Man., the largest manufacturer of gypsum in Canada, have a controlling interest in the B. C. Gypsum Co., Ltd., and will largely direct operations of that company.—*Vancouver (B. C.) Province.*

The Cebu-Portland Cement Company

A Good Example of an Governmental Ownership Experience

(Assistant Trade Commissioner E. B. George, Manila, Philippine Islands)

THE Cebu-Portland Cement Co., a three million peso plant is at present in charge of a political appointee, keen and capable, but without previous experience in the cement industry. The plant has in recent months turned out cement of very inferior quality, which either refused to set or set too rapidly and which in many cases had to be torn down and replaced. This was due to the attempt to use a considerable supply of bad clinker by mixing it with good clinker. This defect is claimed to have been adjusted, which may be true. The plant itself is very modern and makes an excellent impression. Its cost, however, is so out of proportion to present values that the interest and amortization charges impose a very heavy burden and are undoubtedly a feature in making the cost of their product so high. Their limestone deposits are near by and can be used with a very little intermixture of silica, gypsum, etc. The coal is secured from the Uling Uling coal mines, privately owned, which the manager of the plant is anxious to have the government purchase.

The plant lies at some distance from the port, however, and necessitates a considerable extra charge on that account. Another very great difficulty is that the inter-island freight rates to Manila are so high that it costs more to lay down a barrel of Apo Cement (the name of the plant's product) than it does to ship a similarly sized barrel from Japan.

The government is understood to have given up its plan to sell the plant. This means that the government is unable to secure any price which is at all proportionate with the value which they place on the plant and will therefore continue to subsidize it.

Price Less Than Cost

The manager of the plant states that his present cost of turning out cement is about P2.75. This does not include the cost of the barrels, nor the rail charges from the plant to Cebu, nor the freight from Cebu to Manila, nor the interest and amortization charges. Figuring individual items one might arrive at P5.50 per barrel without even then pretending to make a complete itemization (about $2.75).

It is suspected that Apo cement costs well over six pesos. The selling price is considerably under that, ranging from five pesos to five-fifty pesos at present. The manager's defense is that the very existence of the plant has greatly brought down the expense of the cement to consumers; whereas at the time of the plant's establishment cement was selling at eight and nine pesos, the price is now under six pesos. It is a question as to how far the cost might have naturally dropped with the general deflation of prices which has developed since that time, aided and abetted by strong foreign competition. The recently issued annual report of the cement company is reported to show a loss of three hundred thousand pesos. It is not certain just how this result was reached, inasmuch as the government industries have a habit of intermixing investment and operating charges so as to make their final conclusions of rather doubtful reliability. However, this report reaffirms the often made recommendation of the management that 2,000,000 pesos of additional capital be invested in the plant in order to increase the economy of operation. It is therefore interesting to note the following editorial comment from a Filipino newspaper on this proposal:

Local Newspaper Raps Management

"It is inconceivable how the government can appropriate the amount of two million pesos for the Cebu Portland Company, on the plea that the sum is needed to prevent the company from going to the wall, after it has been announced that no longer would there be any direct financial aid given to the government-owned corporations.

"The officials of the government cement company seem to have infinite faith in their stock argument 'give us more money or lose all the amounts invested in this business' in order to frighten the legislature into submission to their demand for more and more funds.

"If the company, even with the advantages it enjoys from recent legislation imposing higher import duties on cement, still feels that it must hazard another two million pesos of the people's money in an attempt to show a favorable balance sheet, then it would be to the interest of the public for the government to keep those two million for its more important activities, and let the cement company seek its own salvation elsewhere.

"There is no surety whatsoever that it would be successful with an additional capital. Its record, either from the point of view of management or from that of the market condition involving keen competition, makes us incline to the conclusion that it is inadvisable for the government to invest even a few thousand pesos much less two millions, in the cement business.

"So badly managed has been this company that whatever profits has been made in it has fallen into private hands, and the government has been left to hold the empty bag.

Should Sell Plant Even at a Loss

"If as reported, there is some prospect of its sale, there should be no hesitation to dispose of it to private interests. The exploitation of the cement industry is replete with conditions which the government, in business, is unable to meet. It is exacting in its demand for initiative and the driving power that is found only among men who want to succeed, who have made of business their life career, who understand, as if from intuition the details and the requirements of their work. The officials who are today responsible for the success of the cement company may have been public officials, but they surely would not be the peer of such men. And the spirit of dependence on the government which these officials must feel works against their becoming model production or sales managers. That they have the public treasury to fall back on is certainly demoralizing. Their connection with the government limits their ability, granting that they possess it, to paying attention to routine matters, their fighting spirit dormant, if not deadened. There is thus no reason why the government should invest two million pesos more in a business in which there is no prospect of immediate success."—*U. S. Department of Commerce Reports.*

New Tacoma Company to Develop Gypsite Deposit

RECENTLY incorporated with a capital of $100,000, the Sulpho-Lime Products Co., Tacoma, Wash., will build a plant to pulverize gypsite from a 50-acre deposit secured by the company at Canford Mills, in the Nicola valley in British Columbia, Canada, about 250 miles north of Sumas. The vein of gypsite varies from three to 16 ft. in thickness and is said to be about 75% pure. The pulverized product will be marketed as a destroyer of plant and fruit tree insects and accelerator of plant growth.

The formation has gone beyond the gypsite state and is in soft, smooth chunks that are easily crushed. It is being milled at present in plant of the Sands Manufacturing Co. at 832 East 25th street, Tacoma, until the company completes its own plant.

The company plans to dust a considerable acreage in eastern Washington by airplane to demonstrate the effectiveness of the product.

The officers of the company are: I. W. Park, president; C. Walter Atkins, vice-president; J. T. Jones, secretary-treasurer.

Tests Show Some Foreign Cements Inferior to American Product

Resolution Adopted at Statewide Mineral Conference Held in Los Angeles, Calif., Protesting Against Use of Foreign Cement—Tentative Ordinance Adopted for the Use of Cities, Counties and State

AT a statewide mineral conference held in Los Angeles recently a resolution was adopted strongly protesting against the use of imported cement. It was pointed out at the meeting that repeated tests had shown the foreign product to be inferior to American cement.

A tentative ordinance for all cities, counties and the state to adopt containing rigid cement specifications was submitted at the meeting.

Herewith is presented the resolution suggested for adoption by the Southern California Section of the Statewide Mineral Conference, Cement and Gypsum Manufacturers Group:

WHEREAS, foreign cement is being imported in considerable quantities to California ports, and

WHEREAS, some years ago there was a duty of 32 cents per bbl. on all imported cements, which duty does not now exist, and

WHEREAS, most of the imported cements coming into the California market are from Belgium, and the Belgian franc is only worth today, in American money, one-fourth of what it was in pre-war days, cement manufactured abroad can and does compete in this market because of this deflated exchange rate, and

WHEREAS, the manufacturers of local cement consume large quantities of fuel oil, power, powder, gypsum, bags, and iron and steel products and employ much skilled and unskilled labor and are a very material part of the business and economic welfare of this community and all parts of the state of California, and

WHEREAS, in addition the railroads, which in turn employ much skilled and unskilled labor and buy many supplies, enjoy millions of dollars worth of freight business from the cement companies when cement manufactured in California is used in place of foreign cement, and

WHEREAS, every barrel of cement manufactured in California carries with it its proportionate share of the Federal, State, County and City taxes, which goes for proper protection and administration of the welfare of citizens of this State, and

WHEREAS, most of the foreign cement imported is stored in warehouses at the ports where it deteriorates rapidly on account of damp air, and

WHEREAS, tests made on such cement on its arrival are not properly representative of the cement after it has been stored a relatively short period of time, and

WHEREAS, imported cements which have become lumpy from exposure to dampness have been reconditioned and resacked, frequently in sacks or other brands, and

WHEREAS, considerable quantities of foreign cement have failed to pass the standard tests on arrival at the ports, but such cement is sold and used in construction work by people who are not aware of its poor quality, and

WHEREAS, the Board of Public Works of the City of Los Angeles has found that the average test of local cements show approximately 25% greater strength than the average tests on the foreign cements received there, and

WHEREAS, foreign cements which have failed to pass standard tests are sold to an unsuspecting public, and

WHEREAS, there is a great underlying preference for these home products, for any or all of these reasons; there is an inclination on the part of public bodies to specify that only American made cements be used in work under their jurisdiction, and this is also true of the War Department of the U. S. Government; therefore,

BE IT RESOLVED, that the Statewide Mineral Conference is hereby requested to use its utmost influence with architects, engineers and public officials to protect domestic procedure of cement, to adopt specifications or ordinances, reading as follows:

Portland Cement

"All cement shall be true portland cement and must conform to the following requirements and be subject to the following test which will be open to the contractor. Samples for test may be taken from every package delivered or proposed to be used upon the work, and unless they meet the requirements herein specified, such package or packages of cement will be rejected.

"No cement will be accepted, tested or permitted to be used unless delivered in the original unopened packages, filled at the cement mill and with the manufacturer's name and the brand of the cement plainly marked thereon. Each sack must contain not less than ninety-four (94) lb. net of cement. Such sacks of cement must be uniform in weight and the sacks shall be whole and untorn. The cement must be dry and free from lumps that cannot be crushed to powder with the fingers.

"No cement shall be used which has been mixed in any way with any other brand or quality of cement or which has been tampered with in any way after having been placed in the original package of the manufacturer, nor shall any cement be used from any package containing lumpy cement or cement which has been reground. To prevent sifting or loss of weight, and for protection from moisture, all cement that has been transported by water must be in paper-lined cloth sacks, the paper liners to be stout, with open mouths, or the sealed type with valves for filling."

BE IT FURTHER RESOLVED, that this Statewide Mining Conference of California is hereby urged to seek the co-operation of such bodies as the Los Angeles Chamber of Commerce, San Francisco Chamber of Commerce, and the California Development Association, in putting such ordinances into effect, by addressing communications to all other Chambers of Commerce in the State of California, as well as all State, County and Municipal authorities on this matter.

BE IT FURTHER RESOLVED, that the members of this conference and all their associates use their best efforts with the California Congressional delegation to the end that a reasonable duty be placed upon the importation of true portland cement.—*San Francisco (Calif.) Pacific Builder.*

Road Building Cost in England

WORK is now in progress on a new highway extending from the city limits of Birmingham to the city of Wolverhampton, the Department of Commerce is advised by Vice Consul Brown, Birmingham. The new road is to have a length of 3¾ miles. Its estimated cost, including the construction of the necessary bridges, is £570,000 ($2,775,000 in round numbers at the normal rate of exchange) or an average of £58,460 ($285,000) per mile. The total width of the highway is 100 ft.; in the center is to be a 40-ft. roadway, and on either side will be constructed a verge, grass covered, 20 ft. wide.

Portland Cement Output in May

With Estimates of Total Cement Output and Value, by States and Districts, and Shipments of Portland Cement from Mills Into States

THE following tables, prepared under the direction of Ernest F. Burchard of the Department of the Interior, Geological Survey, are based mainly on the reports of producers of portland cement. The May, 1925, totals include estimates for three plants. Production for the month is the greatest on record, shipments are the highest yet recorded for any May and have been exceeded only in three other months, and stocks are over 13% higher than in May, 1924.

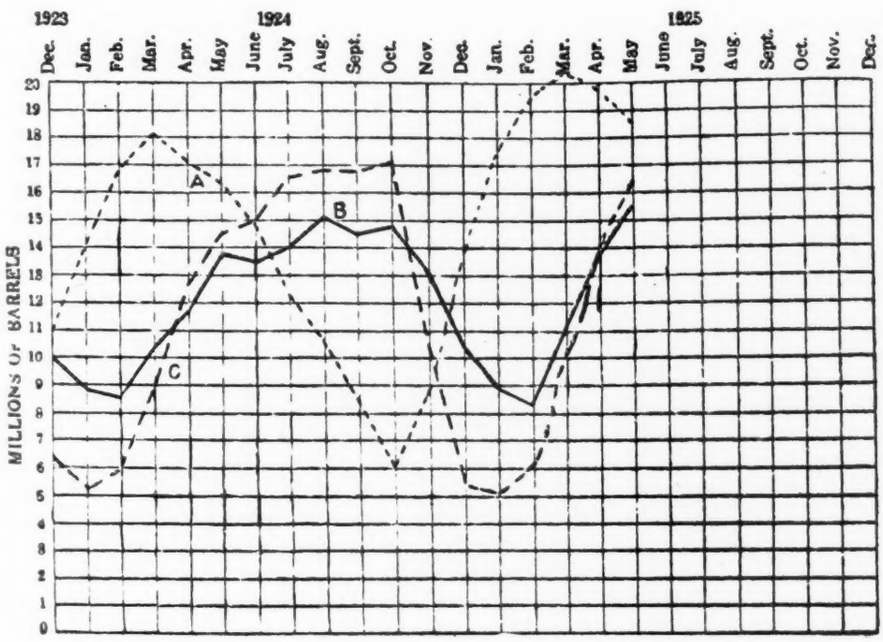
Total production in May was 15,503,000 bbl. as compared with 13,777,000 bbl. for May, 1924, and 13,807,000 bbl. in April, 1925. Thus there was an increase in production for the month of 1,696,000 bbl. over April and 1,726,000 bbl. over May, 1925. Shipments for the month totaled 16,735,000 bbl. as compared with 14,394,000 bbl. for April and 14,551,000 bbl. for May, 1924, thus showing an increase of 1,341,000 bbl. over April and 2,184,000 bbl. over May, 1924.

Clinker Stocks

Stocks of clinker, or unground cement, at the mills at the end of May, 1925, amounted to about 8,892,000 bbl. compared with 9,731,000 bbl. (revised) at the beginning of the month.

Distribution of Cement

The following figures show shipments from portland cement mills distributed among the states to which cement was shipped during March and April, 1924 and 1925:


1923
1924
1925
Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
MILLIONS OF BARRELS
A
B
C

(A) Stocks of finished portland cement at factories. (B) Production of finished portland cement. (C) Shipments of finished portland cement from factories

EXPORTS OF HYDRAULIC CEMENT BY COUNTRIES IN APRIL, 1925*

Exports to—	Barrels	Value
Canada	1,850	$9,437
Cuba	26,431	63,979
Other West Indies	6,230	16,588
Mexico	13,637	39,188
Central America	11,708	31,201
South America	25,794	81,554
Other countries	3,858	21,884
	89,508	263,831

DOMESTIC HYDRAULIC CEMENT SHIPPED TO ALASKA, HAWAII AND PORTO RICO IN APRIL, 1925*

	Barrels	Value
Alaska	1,104	$3,697
Hawaii	1,055	2,721
Porto Rico	8,427	20,451
	10,586	26,869

*Compiled from records of the Bureau of Foreign and Domestic Commerce and subject to revision.

PORTLAND CEMENT SHIPPED FROM MILLS INTO STATES, IN MARCH AND APRIL, 1924 AND 1925, IN BARRELS*

	March		April	
Shipped to—	1924	1925	1924	1925
Alabama	166,154	177,510	162,471	191,451
Alaska	132	294	231	709
Arizona	25,659	27,009	30,146	31,264
Arkansas	82,059	72,198	105,078	94,695
California	850,536	1,029,118	899,357	1,027,744
Colorado	58,747	102,537	111,833	131,363
Connecticut	73,917	113,668	143,013	160,616
Delaware	15,035	21,766	38,393	41,573
District of Columbia	51,768	58,474	55,800	70,765
Florida	157,704	272,094	140,291	261,180
Georgia	104,100	140,634	114,026	112,250
Hawaii	2,953	1,500	5,478	2,250
Idaho	16,502	17,667	30,538	28,393
Illinois	962,510	846,638	1,366,987	1,467,815
Indiana	283,594	255,597	454,111	433,996
Iowa	146,692	161,164	254,796	284,477
Kansas	124,379	212,402	248,942	232,220
Kentucky	103,672	115,222	156,403	174,795
Louisiana	110,922	98,193	140,357	108,250
Maine	22,975	21,702	34,998	36,163
Maryland	131,737	143,291	163,161	207,844
Massachusetts	188,117	257,381	309,111	344,406
Michigan	424,546	437,712	655,933	859,815
Minnesota	212,160	173,618	240,635	321,854
Mississippi	28,800	35,778	41,698	48,174
Missouri	201,370	379,157	392,769	489,316
Montana	10,033	16,450	23,446	23,030
Nebraska	78,210	99,780	153,517	180,951
Nevada	6,258	7,254	7,625	10,767
New Hampshire	27,155	27,592	35,556	39,906
New Jersey	373,059	498,227	537,307	722,751
New Mexico	16,007	18,865	24,154	19,699
New York	1,043,786	1,159,830	1,558,728	1,717,441
North Carolina	161,171	200,097	232,887	277,616
North Dakota	15,741	16,589	25,531	38,937
Ohio	501,408	592,069	752,723	894,683
Oklahoma	162,654	203,161	269,777	201,886
Oregon	90,932	103,813	120,593	101,661
Pennsylvania	641,390	808,636	954,720	1,250,501
Porto Rico	0	0	0	0
Rhode Island	30,219	54,083	56,400	79,063
South Carolina	49,767	72,929	49,837	65,806
South Dakota	36,289	40,697	37,602	57,039
Tennessee	104,162	116,856	147,706	133,037
Texas	295,361	381,320	389,892	401,517
Utah	30,921	28,567	45,073	33,469
Vermont	13,614	10,312	23,082	25,353
Virginia	141,142	132,891	179,862	160,139
Washington	153,249	151,814	167,640	180,845
West Virginia	72,567	85,703	147,927	134,357
Wisconsin	239,493	142,620	377,659	358,379
Wyoming	13,079	16,358	22,017	19,981
Unspecified	55,950	46,236	69,520	34,875
	8,910,357	10,205,073	12,707,337	14,327,067
Foreign countries	84,643	73,927	63,663	66,933
Total shipped from cement plants	8,995,000	10,279,000	12,771,000	14,394,000

*Includes estimated distribution of shipments from three plants for March and April, 1924; from five plants for March, 1925; and from four plants for April, 1925.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN MAY, 1924 AND 1925, AND STOCKS IN APRIL, 1925, IN BARRELS

Commercial district	Production—May, 1924	Production—May, 1925	Shipments—May, 1924	Shipments—May, 1925	Stocks at end of May, 1924	Stocks at end of May, 1925	Stocks at end of April, 1925*
E'n Penn., N. J. & Md.	3,463,000	3,660,000	3,690,000	4,125,000	4,165,000	4,106,000	4,571,000
New York	685,000	838,000	747,000	907,000	1,238,000	1,164,000	1,232,000
Ohio, W'n Penn. & W. Va.	1,201,000	1,540,000	1,237,000	1,590,000	1,883,000	1,966,000	2,017,000
Michigan	877,000	1,120,000	1,010,000	1,201,000	765,000	1,246,000	1,326,000
Wis.,† Ill., Ind. & Ky.	1,960,000	2,400,000	2,133,000	2,586,000	2,524,000	3,369,000	3,555,000
Va., Tenn., Ala. & Ga.	985,000	1,162,000	996,000	1,233,000	771,000	611,000	683,000
E'n Mo., Ia., Minn. & S. D.‡	1,481,000	1,552,000	1,509,000	1,714,000	2,491,000	3,138,000	3,300,000
W'n Mo., Neb., Kans. & Okla.	1,053,000	1,130,000	1,081,000	1,169,000	1,096,000	1,558,000	1,596,000
Texas	412,000	392,000	440,000	429,000	308,000	258,000	294,000
Colorado & Utah	267,000	265,000	279,000	227,000	183,000	350,000	312,000
California	1,069,000	1,067,000	1,106,000	1,130,000	382,000	456,000	520,000
Ore., Wash. & Mont.	324,000	377,000	323,000	424,000	597,000	424,000	471,000
	13,777,000	15,503,000	14,551,000	16,735,000	16,403,000	18,646,000	19,877,000

*Revised. †Began producing and shipping June, 1924. ‡Began producing December, 1924, and shipping January, 1925.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1924 AND 1925, IN BARRELS

Month	Production 1924	Production 1925	Shipments 1924	Shipments 1925	Stocks at end of month 1924	Stocks at end of month 1925
January	8,788,000	8,856,000	5,210,000	5,162,000	14,155,000	17,656,000
February	8,588,000	8,255,000	5,933,000	6,015,000	16,815,000	19,689,000
March	10,370,000	11,034,000	8,995,000	10,279,000	18,189,000	20,469,000
First quarter	27,746,000	28,145,000	20,138,000	21,456,000	.....	.....
April	11,726,000	13,807,000	12,771,000	14,394,000	17,159,000	*19,877,000
May	13,777,000	15,503,000	14,551,000	16,735,000	16,403,000	18,646,000
June	13,538,000	.....	15,036,000	.....	14,903,000	.....
Second quarter	39,041,000	.....	42,358,000	.....	.....	.....
July	14,029,000	.....	16,614,000	.....	12,319,000	.....
August	15,128,000	.....	16,855,000	.....	10,666,000	.....
September	14,519,000	.....	16,827,000	.....	8,404,000	.....
Third quarter	43,676,000	.....	50,296,000	.....	.....	.....
October	14,820,000	.....	17,160,000	.....	6,073,000	.....
November	13,141,000	.....	10,289,000	.....	8,928,000	.....
December	10,435,000	.....	5,506,000	.....	13,913,000	.....
Fourth quarter	38,396,000	.....	32,955,000	.....	.....	.....
	148,859,000	.....	145,747,000	.....	.....	.....

*Revised.

*Imports and Exports**

IMPORTS OF HYDRAULIC CEMENT BY COUNTRIES AND BY DISTRICTS in APRIL, 1925

Imported from	District into which imported	Barrels	Value
Belgium	Massachusetts	8,275	$11,971
	Philadelphia	36,692	47,345
	Florida	65,174	90,835
	Los Angeles	36,662	48,196
	San Francisco	8,364	12,762
	Oregon	1,710	4,514
	Washington	4,272	9,267
	Total	161,149	$224,890
Denmark	Porto Rico	18,093	$26,616
France	New York	1,203	$2,538
Germany	New Orleans	894	$930
Norway	Maine and New Hampshire	3,026	$4,786
	New Orleans	7,078	11,134
	Hawaii	5,969	9,200
	Total	16,073	$25,120
United Kingdom	New Orleans	274	$732
	Grand total	197,686	$280,826

*Compiled from records of the Bureau of Foreign and Domestic Commerce and subject to revision.

IMPORTS AND EXPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1924 AND 1925

Month	Imports 1924 Barrels	Imports 1924 Value	Imports 1925 Barrels	Imports 1925 Value	Exports 1924 Barrels	Exports 1924 Value	Exports 1925 Barrels	Exports 1925 Value
January	153,839	$250,799	229,838	$361,098	88,586	$252,497	71,596	$207,547
February	162,930	219,588	119,077	206,308	62,606	194,110	56,249	181,356
March	160,517	254,745	218,054	374,839	91,224	254,687	65,248	200,410
April	148,137	227,300	197,686	280,826	83,200	229,183	89,508	263,831
May	161,304	232,950	(†)	(†)	88,850	262,290	(†)	(†)
June	196,655	283,112	.....	.....	74,064	229,852	.....	.....
July	108,944	181,111	.....	.....	60,139	186,073	.....	.....
August	192,634	305,690	.....	.....	85,883	251,904	.....	.....
September	138,369	232,991	.....	.....	69,470	206,921	.....	.....
October	214,987	337,199	.....	.....	79,180	253,479	.....	.....
November	198,806	305,598	.....	.....	42,490	130,519	.....	.....
December	173,814	285,481	.....	.....	52,851	163,639	.....	.....
	2,010,936	$3,116,564	.....	.....	878,543	$2,615,154	.....	.....

†Imports and exports in May, 1925, not available.

Statistics on Annual Production of French Cement Industry

(Vice Consul W. W. Corcoran, Boulogne-sur-mer)

THERE was a decided slowing down in the expansion of the French cement industry during the 12 months of 1924, as compared with the growth of the industry during the preceding calendar year according to statistics compiled by the National Association of French Cement makers, known as La Federation des Chambres Syndiicales des Fabricants de Chaux et Ciments.

According to these statistics, the present capacity production of the industry is 5,985,500 metric trons, of which 3,943,000 metric tons is portland artificial cement. The figures show that the industry in 1923 increased its capacity production by 1,137,450 metric tons, whereas the increase shown for the calendar year of 1924 is only 52,900 metric tons.

The capacity production for the three years as given by the manufacturers' association is as follows:

	Metric tons 1922	1923	1924
Portland artificial	3,033,500	3,907,000	3,943,000
De Grappiers	439,650	252,500	264,700
Natural	763,400	993,600	895,800
Milky	472,600	666,500	725,000
White	59,000	58,000	81,000
Melted	27,000	55,000	76,000
Total	4,795,150	5,932,600	5,985,500

The great artificial portland cement industry in the Pas-de-Calais did not show any expansion whatever during 1924, according to the manufacturers' association statistics. The industry in this section grew up so rapidly during the years immediately succeeding the Great War that beginning with the opening months of 1924 the makers began to fear overproduction and it is presumed that this apprehension arrested further expansion.—U. S. Department of Commerce Reports.

Improvements Begun at Universal Plant, at Duluth, Minn.

EIGHT bins are now under construction at the Duluth, Minn., plant of the Universal Portland Cement Co. at a cost of $38,000. The bins are circular, 20 ft. in diameter, 50 ft. high and will each hold 10,000 bbl. of raw material. Work of installing the two new dust collectors and a 300 ft. chimney at the plant as announced in May 2 issue of ROCK PRODUCTS is also well under way.

Linwood Cement Awards General Contract for Plant

THE Linwood Cement Co., Davenport, Iowa, has awarded the general contract for the construction of its proposed cement plant, consisting of eight one-story buildings estimated to cost $1,500,000 with machinery, to the H. W. Horst Construction Co. of Rock Island, Ill.

More About Scottish Developments in Hydraulic Gypsum

Claimed To Stick Perfectly To Portland Cement— Some Construction Experience with New Product

SINCE the publication in ROCK PRODUCTS of April 18, 1924, p. 57-58, of the development of a new hydraulic gypsum cement in Scotland, we have received from its inventor at Glasgow a sample of gypsum plaster on a plaque of portland cement and the following additional data:

"When I refer to the first stage of the process, I speak of the physical and chemical changes expected of our original investigations. This stage is really complete in itself and produces a cement possessing the faculties outlined in the Consular report. The second stage is still incomplete as a commercial proposition, but produces a condition that gives a cement possessing an enormous tensile and crushing strength with a hardness almost equal to quartz.

"This gypsum cement is isomeric and polymeric (isomeric means composed of the same chemical elements combined in the same proportions but differing in one or more properties owing to a difference in structure; polymeric means of the same elements combined in the same proportions but of different molecular weights) with every other condition of gypsum arrived at through any other process known; that is, there are isomeric and polymeric zones that are not antagonistic to each other and separately or combined agree with the actions or reactions of portland cement. Consequently the cement itself, or with aggregate, bonds perfectly with portland cement on either dry or green surfaces; and in conjunction with portland cement with suitable aggregate, an undercoating compound is produced superior to anything known in this country.

"In this compound, portland cement is employed principally to carry a super-waterproofing agency where such is specially desirable. It will be seen that a cement of these characteristics produces interiors as durable as the exposed walls, whether or not they be of brick or stone.

"The November, 1924 issue of *Concrete* contained an article with reference to the difficulties of bonding gypsum cements with portlands; and in the December number of the same trade journal there appeared a quotation from an article in *Zement* by Prof. Haegermann wherein he states he has provided information which proves that all gypsum cements, including Keene's, are harmful to portland cement when mixed with the latter. The cement we produce positively overcomes these difficulties.

"In addition to its being proven a definitely hydraulic production, Astroplax has an extraordinary spatial disposition extending to at least twice that of the highest claim for the next best—this comparison being taken on properly straightened walls. In a report recently released by one of the largest users of 'Atsroplax,' a public works concern of world-wide repute, it is stated that their experience has been well over 500 superficial yards to the ton weight of cement, averaging some hundreds of tons. On an average well-straightened surface we have got up to 760 superficial yards; and on an ideally finished undercoat we have exceeded 1000 yards to the ton. These figures, of course, refer to the finish or "skin" coat.

"The above mentioned firm was so assured of the complete hydraulic qualities of 'Astroplax' that they took the risk of plastering one of their contracts simultaneously with the general building construction in an unusually large structure for this country.

"As each story of this building was floored, and while the progressing floor was open to the sky, the apartments below were taken over by the plastering department and worked to a finish. The upper sides of the exposed floors (reinforced concrete) were covered with pools of rain water which found a way through, of course, and the ceilings and walls below were practically running with water. As soon as 'Astroplax' was spread percolation absolutely ceased, the material took its set irrespective of the presence of such excess water, and the job exceeds everybody's expectations. I was informed by the master of works on the job that his principals would have the use of the building plastered with our cement about twelve months sooner than had any other plastering material been preferred. I omitted to remark that the report referred to in the last paragraph was at the instance of a Government Department and not for us.

"Another unsolicited testimonial as to the unique qualities possessed by 'Astroplax' is found in the following translation of a letter recently received from Spain:

It appears from the first trials which are being made, that we must incline to believe that it combines the properties of an excellent material. For the present I may tell you that the first trial consisted in making a brick with "Astroplax" alone and another with two parts of sand. Twenty-four hours after being constructed, the manufacturer tells us that the mason can work with them as well as, or better than, with any other material. This gentleman is very well impressed with its great consistency, and its superior appearance after setting. He says that along with a brick of portland cement, and forcing it, the portland cement brick breaks before the "Astroplax" and that also when the two materials are joined it maintains its strength. He also notes that after a brick has been finished, only by rubbing it a little with the fingers it acquires a magnificent brilliance. His opinion is that perhaps it would be better than any other material for the manufacture of bricks.

He has shown one of these bricks to a mason who is of the opinion that with this material an artificial stone could be manufactured such as has not been known up to now. * * * is very satisfied with the results of the first trials, and this in spite of being rather reactionary to innovations. On this occasion his interest on the subject increases the more he examines the results. Today he spoke to me of "Astroplax" as a great thing.

"'Astroplax' has been used indiscriminately for interiors and in the weather, and the following does not by any means exhaust the uses to which it has been put: Plain surfaces, cornices, skirtings, picture rails (these last two 'run' on), mantle-pieces, architraves, etc., pilasters, balustrades, non-skid steps and paving, tiles, slating, ornamental gables, chimney-head decorations, rough-casting, pebble-dashing, black-boards, pointing, puttying, painting (water and oil), artificial stone in block and rendered and lined off, with asbestos and fossil earth for boiler coverings, etc.

"With the single exception of boiler coverings, every reference made in this or in the Consular report, or what may be inferred therefrom, has been undertaken by buildings or plastering contractors who have purchased 'Astroplax,' and the execution of the work suggested has not been in our hands. 'Radical' is the proper term to apply to this production, and we have preferred that the proofs of the claims should come out indisputably in the hands of others.

"'Astroplax' also possesses unique insulating properties, and when mixed with asbestos and fossil earth it produces a boiler covering of great excellence. The composition is treated as a cement and is plastered on the boiler plates, whether or not these be hot or cold, in ordinary plastering fashion. The resultant covering is a nearly perfect insulator, as compared with the standard substances found in this neighborhood today, and when set 'Astroplax' presents a hard and durable surface.

"The sanitary qualities of 'Astrolax' cannot be questioned, and when the material

enters its final set there is a noted reaction that renders it impervious to vermin or life in any form. This reaction continues indefinitely, making the material absolutely vermin-proof. 'Astroplax' also excels as a sanitary wall-covering, for the material will stand indefinitely repeated washings with any cleansing agencies that may be employed.

"Under separate cover, I am forwarding a plaque of 'Astroplax' on portland cement. I have purposely selected a piece made of the most rubbishy gypsum we can find on this side in order that you may judge what our treatment does for the worst raw material available. I suggest that you saturate this specimen with water for twenty-four hours and allow it to dry for the same period. You can repeat this test as often as you desire, and you will notice that this repeated testing will make no difference in the qualities of the material. Samples of 'Astroplax' have also been submitted to the United States Bureau of Standards."

Conclusions

We have soaked the sample sent in water, as the inventor suggested, and it is true that it exhibits hydraulic properties that ordinary gypsum plaster does not have. When rubbed under water, however, there is discoloration which shows some slight softening or disintegration.

We hold no brief for the material, but give space to the inventor's claims as evidence that the subject of hydraulic gypsum cements and plasters is receiving attention abroad, and that the subject is one which promises much development. The same is true of the future of portland cement and limes.—The Editors.

Gypsum Tile from Calcium Sulphate Wastes

IN the June issue of *Chemical and Metallurgical Engineering* appeared an article, "Turning Calcium Sulphate Wastes into Valuable Products," by Graham L. Montgomery. It told of the process by which this byproduct material from phosphoric acid and mono-calcium phosphate manufacture is now converted into stucco and gypsum tile by the Rumford Chemical Works, Providence, R. I. The following is a brief abstract of the article:

Numerous attempts made to utilize this waste hydrous calcium sulphate as a substitute for natural gypsum in the manufacture of plaster stucco and other building materials had met with little success. The stucco made therefrom sometimes would not set at all and when it did set would later deteriorate, becoming again soft. Robert S. Edwards, development engineer at the Rumford plant, discovered that impurities of phosphoric acid in the synthetic gypsum was largely the cause of this phenomena. The company has developed, to remove this phosphoric acid, a process of neutralization and washing.

The calcium sulphate is separated from the phosphoric liquor in fine stages of Dorr thickening. In the sixth stage partial neutralization is effected and a slurry formed containing about 70% free moisture. The slurry is then thoroughly filtered and washed. The cake from this filter is then made into a slurry with about 65% free moisture and run into batch tanks, where final neutralization is effected. This slurry is fed to a centrifugal in which the moisture content is reduced to about 18% and in which the sulphate takes the form of light, fluffy grains. This treatment is said to produce a material that, after calcination, will set up more densely than the same raw material would produce if dehydrated by other means.

The material after the centrifuging is complete is calcined. The presence of carbon in the calcined product (the calcium sulphate being made by the treatment of bone) gives it a light grayish color, thus making it unsuitable for finish or hard wall plaster. It is, however, available for stucco finishes and gypsum tile. The company now manufactures a standard 30x12x3-in. tile, uncored and reinforced with rattan fibre, under the trade name of "Fabricast." Tests on briquets of this material without reinforcing show a tensile strength of from 300 to 350 lb. per sq. in. Plaster made from rock gypsum tested in the same way has a tensile strength of from 450 to 500 lb. per sq. in. In either case the figures are above the standard requirements.

The fact that there are no gypsum or gypsite deposits near Providence, R. I., and as no quarrying or crushing costs are involved, this synthetic product finds a favorable market. At present about six tons of waste calcium sulphate are being reclaimed daily and the company plans to utilize its total capacity of 20 tons as markets are developed.

Canadian Gypsum Statistics for 1924

FINALLY revised statistics on gypsum production as reported by the Dominion Bureau of Statistics, at Ottawa, Canada, under the authority of the Hon. Thos. A. Low, show that the quantity of Canadian gypsum sold during 1924 was appreciably higher than in the previous twelve months. The total production for the year was 646,016 tons with a valuation of $2,208,108 as compared with 578,301 tons at $2,243,100 in 1923. The production was made up of lump, crushed, fine ground and calcined gypsum sold; there was also included the calcined gypsum used in the calcining plants for the production of wall plaster, wall board, alabastine and other gypsum products.

The average values received, by operators were as follows: lump $1.81; crushed $1.82; fine ground $5.82; and calcined $10.27 per ton.

Compared with 1923, the imports remained constant while the exports, principally crude gypsum, increased approximately 75,000 tons to a total of 477,462 tons.

SHIPMENTS OF GYPSUM, CANADA, 1924

	Tons	Value
Shipments by grades—		
Lump	139,618	$253,191
Crushed	381,262	693,785
Fine ground	5,478	31,882
Calcined	119,658	1,229,250
Total	646,016	$2,208,108
Shipments by Provinces—		
Nova Scotia	441,752	$915,845
New Brunswick	86,738	476,804
Ontario	88,121	467,097
Manitoba	29,375	348,212
British Columbia	30	150
Total	646,016	$2,208,108

Ohio Gypsum Workers Get Instruction in First Aid

THE Ohio mine rescue car "Black Diamond" paid Toledo a brief visit recently and marked the first time in history that it has been in regions other than the coal mining counties. It was shunted to a spur in the Wheeling and Lake Erie R. R. yards after having been brought from Port Clinton, where it spent a week and was later transferred to Genoa. Nearly 500 employes of the United States Gypsum Co.'s plant at Genoa will receive training in first-aid practices, to be taught by instructors from the mine rescue car. A class of 65 graduated at the Port Clinton plant at the end of the training course.

Under the auspices of the state department of industrial relations, miners and mill workers are being given first-aid training throughout Ohio. Certificates of competency are granted those who take first-aid training and pass examinations conducted by the state instructors. During two months more than 600 such certificates have been granted.—*Toledo (Ohio) Blade.*

Standard Gypsum Completes Plans for Seattle and Long Beach Plants

PLANS for the first three buildings to be built for the Standard Gypsum Co., on the plant site on Harbor Island, Seattle, Wash., have been completed. The buildings proposed are to be of heavy timbered and frame construction and are estimated to cost $75,000. The contract was awarded to H. H. Winner Co., San Francisco.

The site at 1871 16th avenue, southwest, is 585x512 ft. Plans call for a sack house, mill and stockpile buildings. The work will be carried out under supervision of the company.—*Seattle Journal of Commerce.*

Work on the construction of the 300-ton plaster mill of the Standard Gypsum Co. at Long Beach, Calif., is under way and a building permit for $87,000 has been secured for the new plant. Wharfage and building construction will employ 70 men.

The plant will be served by the Pacific Electric Ry. Officials of the company are reported to expect the plant to be operating by September 1 of this year.

Hull, Que., plant of the Canada Cement Co., Ltd., an aeroplane view showing quarries, cableway towers

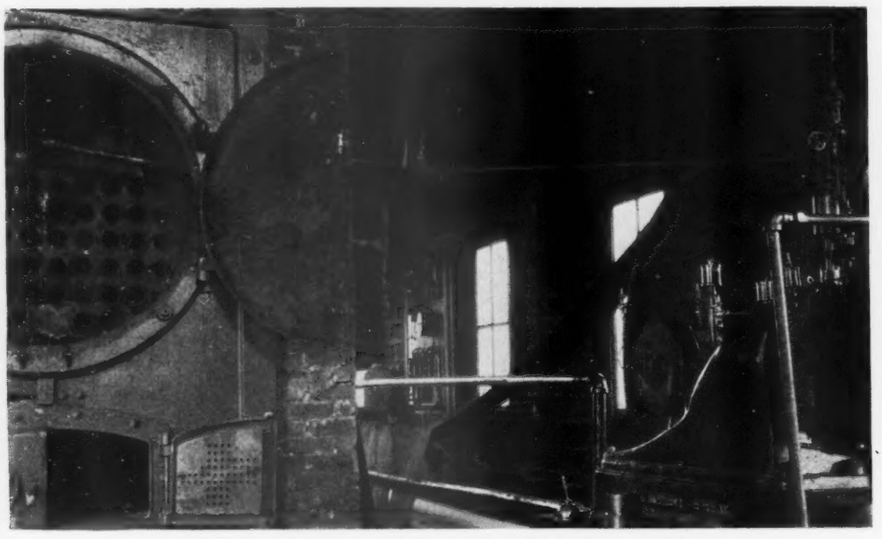
eway towers and mills—a dry process plant. Photo copyrighted by the McCarty Aero Service, Ltd., Toronto, Ont.

Hints and Helps for Superintendents

Boiler Used to Cool Water for Compressor

MANY uses which ROCK PRODUCTS readers have found for discarded boilers have appeared in these pages, but perhaps the most interesting example is that shown in the accompanying photograph. It shows a clever adaptation of scientific principles to the materials which were available.

The picture was taken at the Swanton Lime Works, Swanton, Vt., and the device is due to the ingenuity of John P. Rich, proprietor of the business. The plant has an air compressor which was originally driven by steam. Electric power was installed throughout the plant, and the boiler, which had furnished steam to the compressor engine, was no longer needed.



By using an old boiler as a radiator to cool the water used in the compressor, the expense of purchasing cit water was avoided

For cooling the air the cylinder jackets of the compressor were connected to the city water mains. These jackets are generally designed to use a large quantity of water at a fairly high velocity. This is economy with steam drive as the heated water from the jackets may be used for boiler feed water. But where city water has to be used and then thrown away, such a cooling system is expensive.

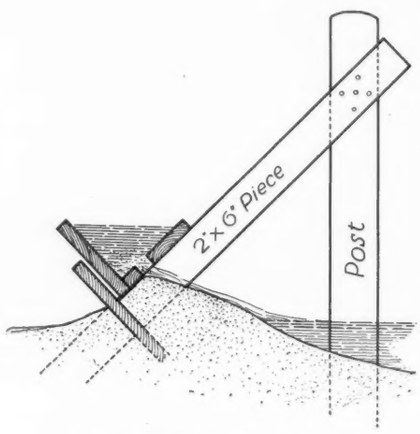
In order to reduce the amount of water required for cooling, it was necessary to increase the area of cooling surface. Mr. Rich did this by piping the cooling system of the compressor into the old boiler. This gave a very large area for radiation, and the air passing through the boiler tubes and around the shell absorbed the heat and carried it out through the stack.

The cooling system now is like that of an automobile engine, the boiler playing the part of the radiator and the water circulating. The expense for city water for cooling has entirely ceased.

Method of Building a Mud Pond

THE cut illustrates a method of building a mud pond or slime pond in which the refuse from a washing plant is settled. It is described in the *Engineering and Mining Journal Press* as it is employed at the cyanide plant of Hamilton, Beauchamp and Woodworth near Jackson, Calif.

The launder used has a series of 1-in. holes in the bottom out of which the water with fine sand and clay is discharged. The side of the launder away from the pond is the highest so that if the launder runs over it will flow out on the side toward the pond.



To raise the pond level, the launder is slid up on the inclined supports

The launder is supported on a slanting piece with about 15 deg. inclination and fastened temporarily in place. When the sand has built up to such a height that the holes are obstructed the launder has to be raised. This is done by sliding it to a new position on the inclined supports and fastening it there.

Boards placed on the side away from the hole prevent the pulp from flowing away from the pond. A laborer distributes the sand as it settles so as to form a bank all around the pond. Afterward the pond is filled.

The article says that by using transverse launders in connection with this system a wall 10 or 12 ft. wide at the top and 6 ft. high can be built. The system can also be used by building up a thin concrete wall with buttresses and then building a sand wall in the manner described on both sides. Drainage holes are provided for the seepage so that there is no accumulation of hydrostatic pressure.

A pipe in the place of a launder has been tried for distributing the pulp and there would seem to be no reason why it would not work just as well. The system was devised by W. A. Darrow.

Air Used to Clean Mine Locomotives

THE motor equipment of a mine locomotive can be made dustproof, but it is a difficult matter to design, for locomotive use, a resistor that will be dustproof and at the same time able to successfully dissipate the heat. The resistor, we might explain, is used to limit the amount of current supplied to the motors, thus increasing or decreasing the speed or pulling power of a locomotive. Current passing through the resistor generates a considerable amount of heat, and therefore makes enclosed construction something of a problem. Accumulations of dirt in an open-type resistor is often the cause of electrical troubles. Breakdowns and delays, however, can be prevented by cleaning at frequent intervals. This may be done quickly and with but little effort by a jet of compressed air.

A regular afternoon performance at a large West Virginia coal mine is to clean each locomotive thoroughly every day before it is taken to the barn. The compressor is just large enough to provide sufficient air to operate a single nozzle; and a mine so equipped can do all manner of cleaning even though the regular mine compressor be shut down for one reason or another.—*Compressed Air Magazine.*

Preventing Uncalcined Plaster from Leaking Into Hot Pit

By G. G. WATSON
Superintendent Plaster City Plant of Pacific Portland Cement Co., Consolidated

MOST plaster calcining kettles are equipped with double slide gates, which re located against the shell of the kettle nd behind the brick work. From this gate here is usually installed a covered chute ading direct to the hot pit. If the operaion progresses in the usual manner, and he gates at the kettle shell close tightly, verything goes well. However, should it evelop that the gates at the kettle shell do ot close tightly, there is a continual dribble f partly calcined gypsum finding its way nto the hot pits and, as the chute is covred, the operators have no knowledge of his until the quality of the plaster becomes doubt.

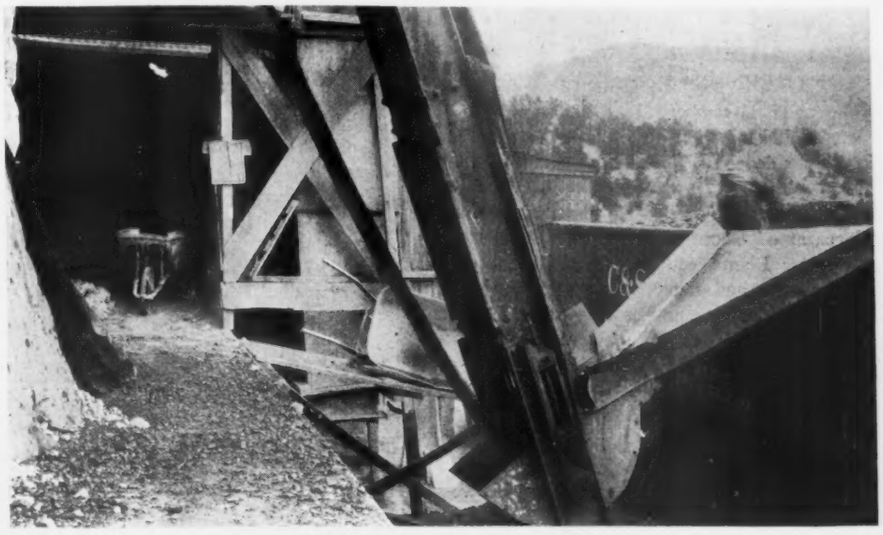
The gate shown in the picture is a safety ate, placed in the chute from the kettle to he hot pit. When the kettle is in the proess of calcining, the operator is required

Safety gate in the bottom of the chute

to have this safety gate open. Any leakage from the kettle gate proper then finds its way down the chute and is spilled on the floor back of the kettle. One may note that the gate opens downward and projects upwards into the chute when it is opened, thereby shutting off from the hot pits any flow which may come from the kettle.

Unloading Coal

AT the plant of the Western Lime Co., Manitou, Colo., coal must be unloaded as it comes to the plant immediately and since there are no facilities for storage, the plant being located on a mountain side, the coal is conveyed directly to the firing floor in the kiln room. To accomplish this a bucket belt elevator has been placed on a concrete foundation adjoining the car tracks. At the boot of the elevator, a hinged chute has been placed, long enough to rest on the side of the gondola cars. Coal is shoveled into the chute and goes up the elevator, discharging on the firing floor. From here, the coal is distributed by wheelbarrow to the various kilns. When the elevator is not in use the chute is swung out of the way.



Coal-handling device at Colorado lime plant

Charging and Discharging Skip

THE skip as a conveyor for materials was developed in Western mines where it superseded the cage and cars in hoisting rock from underground. The car, when it arrived at the top of the shaft, had to be pushed off the cage and to a point above the hopper, dumped and pushed back to the shaft. All this kept a man and sometimes two men reasonably busy. So some ingenious engineer devised the skip, which was like a car body hung in a bail, so that it would tip over at the end of its run and discharge itself into the hopper. When the skip was started on the return trip it righted itself ready to receive another load.

Skips could be made of almost any desired capacity, 10- and 15-ton skips being in common use. Hence it became popular and was gradually applied to other work than that for which it was originally designed.

One such application is shown in the accompanying picture where it is used to feed a lime kiln and take away the burned lime. The vertical skipway up which it is pulled is shown in the center of the picture. This is in the tower or head frame shown. Arriving at the top, the skip discharges toward the observer. There is a sort of butterfly valve on a large scale by which the discharge may be turned into the kiln or into the chute that shows on the left-hand side that leads to the burned lime bin.

At the bottom of the skipway there is a hopper which may be filled either from the kiln-stone bin or from the bottom of the kiln. Gates are fixed so that only one of these is drawn from at a time. By changing these gates and setting the "butterfly" above, the skip will handle either stone to the kiln or burned lime from the kiln.

This arrangement is used by the Pueblo Lime Co., Pueblo, Colo.

Skip for charging or discharging kiln

Financial News and Comment

Southern Phosphate Again Shows Deficit

SOUTHERN Phosphate Corp. for year ended December 31, 1924, reports deficit of $82,202 after taxes, interest and reserve for depreciation and depletion, as compared with deficit of $166,861 in 1923.

Balance sheet of Southern Phosphate Corp., as of December 31, 1924, follows:

Assets: Plants, equipment, lands, etc., less depreciation and depletion $3,897,349; cash $63,369; accounts, notes and trade acceptances receivable $116,675; inventories $133,-713; prepaid items $3,433; deferred charges $133,035; total $4,347,574.

Liabilities: Capital stock and surplus (represented by $239,754 no par shares) $4,247,034; accounts payable, etc., $74,595; accrued interest, commissions, etc., $25,945.

Income account for 1921-1924 follows:

	1924	1923	1922	1921
Gross profit	$207,013	$141,775	$147,330	$314,749
Expenses	47,931	61,842	55,768	68,339
Net	$159,082	$ 79,933	$ 91,562	$246,410
Other income	9,591	7,451	48,542	41,132
Total income	$168,673	$ 87,385	$140,104	$287,542
Interest, taxes, etc.	46,076	59,098	58,067	114,805
Depreciation, depletion, etc.	204,799	195,148	198,966	144,770
Deficit	$ 82,202	$166,861	$116,929	*$27,967

*Net income.

Holders Advised to Deposit Tidewater Cement Bonds

THE Howard Taylor and Co., Baltimore, Md., in a circular letter to holders of the Tidewater Portland Cement Co. first mortgage 6% bonds, due October 1, 1929, advise bondholders to deposit their bonds immediately with the Fidelity Trust Co., Baltimore, depositary. The circular further says: "While we did not have anything to do with placing the bonds originally, we have been looking into the present situation of this company in the interest of some of our clients, who unfortunately hold these bonds for investments. The bondholders' committee which will represent you has strong financial backing and has now obtained a judgment for approximately $680,000 against the Tidewater company.

Wabash Cement Note Issue

AN issue of $1,000,000 6% serial gold notes of the Wabash Portland Cement Co. was recently offered by the First National Co. of Detroit. The notes are dated March 16, 1925, and due serially March 15, 1927-32, and are a direct obligation of the Wabash Portland Cement Co., which has no mortgage indebtedness. The notes mature $100,000, March 15, 1927; $100,000, March 15, 1928, to yield 5¼ and 5½% respectively; $200,000, March 15, 1929, to yield 5¾%, and $200,000 each on March 15, 1930-31-32, to yield 6% respectively.

The company's net earnings before federal income taxes for the year ended December 31, 1924, were $378,700.90 or in excess of six times the maximum interest charges of these notes. The proceeds will be used for the new Ohio plant at Osborne.

Phosphate Mining Company Trustee Appointed

THE BANK OF AMERICA, New York, has been appointed trustee under a mortgage of the company, covering $450,000 6% Series "A" bonds; $400,000 6% Series "B" bonds, and $1,500,000 6% Series "C" bonds.

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

(These are the most recent quotations available at this printing. Revisions, corrections and supplemental information will be welcomed by the editor.)

Stock	Date	Par	Price bid	Price asked	Dividend rate
Alpha Portland Cement Co.	June 22	100	130	135	1½% quar.
Arundel Corporation (sand and gravel—new stock)	June 22	No par	29⅞	30	30c quar. July 1
Arundel Corporation	Feb. 11	50	112	113½	
Atlas Portland Cement Co. (new)	June 22	No par	46	48	1% quar.
Atlas Portland Cement Co. (preferred)	.....	33⅓	.....	.....	
Bessemer Limestone and Cement Co. (common)	.....	.....	.....	.....	1½% quar. July 1
Bessemer Limestone and Cement Co. (preferred)	.....	.....	.....	.....	1¾% quar. July 1
Boston Sand & Gravel Co.	June 5	100	72	72	
Canada Cement Co., Ltd.	June 23	100	102½	103	1½% quar. Apr. 16
Canada Cement Co. Ltd. (preferred)	May 29	100	113	113½	1¾% quar. May 16
Charles Warner Co. (lime, crushed stone, sand and gravel)	June 22	No par	21½	24	50c Apr. 10
Charles Warner Co. (preferred)	June 22	100	98	102	1¾% Apr. 23
Giant Portland Cement Co.	June 22	50	25	28	
Giant Portland Cement Co. (preferred)	June 5	50	51¼	.....	3½% semi-ann. June 15
Ideal Cement Co.	June 22	No par	68	69	75c Mar. 31
Ideal Cement Co. (preferred)	June 22	100	107½	108½	1¾% quar. Mar. 31
International Cement Corporation (common)	June 24	No par	62¾	63⅞	$1 quar. June 30
International Cement Corporation (rights on new common)	June 24	.....	2¾	3⅛	
International Cement Corporation (preferred)	June 8	100	104	106	1¾% quar. June 30
International Portland Cement Co. (preferred)	Mar. 1	.....	30	45	
Kelley Island Lime & Transport Co.	June 23	100	102¼	.....	2% quar. July 1
Lehigh Portland Cement Co.	May 9	.....	70	72	1½% quar. Apr. 1
Michigan Limestone and Chemical Co. (preferred)	Apr. 11	100	.....	.....	1¾% quar. Apr. 15
Missouri Portland Cement Co.	June 23	25	61½	61¾	31½c quar. June 1; 25c ex. June 1
Missouri Portland Cement Co. (serial bonds)	May 29	.....	104½	104½	3¼% semi-annual
Pacific Portland Cement Co., Consolidated	June 19	.....	81	82	
Pacific Portland Cement Co., Consolidated (secured serial gold notes)	May 25	100	100	100	3% semi-annual Oct. 15
Peerless Portland Cement Co.*	June 9	10	8½	9	
Petoskey Portland Cement Co.*	June 9	10	9	9¼	1½% quar.
Pittsfield Lime and Stone Co. (preferred)	.....	100	.....	.....	2% quar. Apr. 1
Rockland and Rockport Lime Corp. (1st preferred)	June 22	100	98	.....	3½% semi-annual
Rockland and Rockport Lime Corp. (2nd preferred)	June 22	100	70	.....	3% semi-annual
Rockland and Rockport Lime Corp. (common)	June 22	No par	70	.....	1½% quar. May 1
Sandusky Portland Cement Co. (common)	June 23	100	103	110	2% quar. Apr. 1, 100% payable in com. stock, Apr. 1
Santa Cruz Portland Cement Co. (bonds)	May 8	100	103½	.....	6% annual
Santa Cruz Portland Cement Co. (common)	June 6	50	64½	.....	$1 Apr. 1
Superior Portland Cement Co.	Mar. 1	100	.....	120	
United States Gypsum Co. (common)	June 23	20	165	166	2% quar. June 30; $1 ex. June 1
United States Gypsum Co. (preferred)	June 19	100	115	116	1¾% quar. June 30
Wabash Portland Cement Co.*	June 9	.....	60	100	
Wolverine Portland Cement Co.	June 23	10	11½	12	2% quar.

*Quotations by Watling, Lerchen & Co., Detroit, Mich.

Lyman-Richey Sand and Gravel Company Bond Offering

THE Peters Trust Co., Omaha, Neb., and Stern Brothers and Co., Kansas City, Mo., are offering $500,000 6% first mortgage bonds of the Lyman-Richey Sand and Gravel Co., Omaha, Neb., dated June 1, 1925 and due serially 1926 to 1935.

Interest payable December 1 and June 1 at the Peters Trust Co., Omaha, or at the office of Stern Brothers & Co., Kansas City, without deduction for the normal federal income tax up to 2%. Coupon bonds in denominations of $1000, $500 and $100, registerable as to principal only. Redeemable December 1, 1925, at 103 and interest; on June 1 and December 1, 1926, at 102 and interest; and at 101 and interest thereafter until December 1, 1934, on and after which date they shall be redeemable at par and accrued interest, provided, however, that the premium in no case shall be more than one-half of one per cent for each year the bonds have still to run. Principal payable at Peters Trust Company, Omaha, Neb., trustee. Exempt from personal property taxes in Nebraska. The company agrees to refund upon application, the present Kansas two and one-half mill tax to holders resident in Kansas who have paid such tax.

Information furnished by H. F. Curtis, president of the company:

BUSINESS: The Lyman-Richey Sand and Gravel Co., incorporated in 1904, is one of the largest producers of sand and gravel in the Middle West, producing a substantial part of all the sand and gravel used in Nebraska. In addition to the furnishing of sand for construction work of all kinds, the company has developed a process for the producing of a sand and gravel mixture which is used very largely in the making of concrete for building purposes and for pavements and highways. The company is also the largest producer in this part of the west of gravel for road purposes. The new road program of the State of Nebraska, which calls largely for graveled highways, makes a very large demand for the company's products.

PROPERTY: The company owns and operates 20 sand and gravel producing hydraulic dredges, mostly 10-in. size, together with gravel washing and separating devices, bins, stripping machines, trackage, and so forth, located at the strategic freight rate points adjacent to the Platte river between Louisville, Neb., and Bridgeport, Neb. These dredges have a conservative 10-hour capacity of sand and gravel of 400 cars daily, or enough material to supply all building and road making requirements both present and prospective, in the company's shipping zone.

The company owns 2,263 acres of Platte Valley land located largely in Douglas, Sarpy, Cass and Dodge counties, Neb., and has under lease 1,130 acres additional, all consisting of selected sand and gravel deposits, being an estimated supply of raw material for twenty-five to thirty years for all its twenty operating units.

PURPOSE OF ISSUE: Proceeds from the sale of these bonds will be used to retire outstanding mortgages, complete payment for properties purchased under contract, furnish the company additional working capital and for other corporate purposes.

SECURITY: These bonds are to be secured by a first mortgage on the entire fixed property of the company, including all real estate owned by the company and all equipment. These properties were valued by the American Appraisal Co. of Milwaukee, as of April 30, 1925, at $1,493,485, after allowing for depreciation.

SINKING FUND: A sinking fund is provided by which the company agrees to pay to the trustee each year, commencing April 1, 1927, 20% of its net profits for the preceding year as defined by the trust indenture, for retirement by call or purchase from offerings at not to exceed the callable price, the longest maturities of bonds outstanding. It is estimated that this sinking fund will retire all of the bonds of this issue outstanding substantially before maturity.

EARNINGS: The books of the company have been audited by Ernst and Ernst who report net earnings available for interest, Federal taxes and depreciation as follows: 1919, $149,738.54; 1920, $178,689.75; 1921, $158,255.25; 1922, $306,575.82; 1923, $312,689.64; 1924, $217,311.91; maximum annual interest on this issue of first mortgage bonds, $30,000. Average earnings for the past six years over 7.3 times maximum interest charges on this issue.

LEGALITY: All legal matters in connection with the issuance of these bonds to be approved by Stout, Rose, Wells and Martin of Omaha, Neb.

MATURITIES AND PRICES
(Accrued Interest to be Added)

Amount	Due	Price	Approximate Yield
$30,000	June 1, 1926	100.48	5.50%
30,000	June 1, 1927	100.47	5.75%
30,000	June 1, 1928	100.00	6.00%
30,000	June 1, 1929	100.00	6.00%
30,000	June 1, 1930	99.00	6.25%
30,000	June 1, 1931	97.60	6.50%
30,000	June 1, 1932	97.25	6.50%
30,000	June 1, 1933	97.00	6.50%
30,000	June 1, 1934	96.75	6.50%
230,000	June 1, 1935	96.50	6.50%

Bonds of the above issue are offered when, as and if issued and received by the bankers and subject to approval of proceedings by counsel.

Atlas Cement Pays Bonds

THE $3,100,000 6% First Mortgage Sinking Fund Gold Bonds due March 1 is paying upon presentation to the First National Bank, which is acting as company's agency for the payment of the bonds, and the coupons appertaining thereto. There will be no refunding of this issue.

Construction Materials Company New Financing

THE Tillotson and Wolcott Co., Cleveland and Cincinnati, and Fenton Davis and Boyle, bankers and brokers, Chicago, Detroit and Grand Rapids, are offering $750,000 in first mortgage 6½% gold bonds of the Construction Materials Co., Chicago, Ill., in denominations of $1000, $500 and $100 at par and accrued interest. The bonds are dated April 15 and interest is payable semi-annually April 15 and October 15. The bonds are redeemable at 102. The bonds mature in lots of $75,000, October 15, 1926, and every year thereafter, the last $75,000 maturing October 15, 1935.

The following information has been summarized from the letter of J. B. Sensibar, president of the company:

COMPANY: The Construction Materials Co. is engaged in the production, sale and distribution of gravel and sand for building construction, street paving and road building and for use by foundries and railroads. The Construction Materials Co. is the largest producer of sand in the Middle West and is also extensively engaged in the making of sand fills for the raising of low lands and for the reclaiming of submerged land adjacent to the shores of the Great Lakes and tributary waterways.

In this branch of the business the company is the leader, having a decided advantage over its competitors. It has done important work of this character for the city of Chicago, for the Johns-Manville Co. at Waukegan, Ill., for the Continental Motors Corp. at Muskegon, Mich., the Mark Manufacturing Co. (now the Youngstown Sheet and Tube Co.) of Indiana Harbor, Ind., and others.

EARNINGS: For 14 years the company has never failed to make a profit in any single year. Its net earnings available for interest, depreciation and federal taxes have averaged for the past five years over $77,000, and for 1924 were $135,319. The earnings for 1924 reflect only in a small measure the recent large capital expenditures of the company. These expenditures include the cost of equipment for the new gravel plant at Ferrysburg, Mich., one of the largest plants of its kind on the Great Lakes. This plant was in only part time operation last year. The capital expenditures also include the cost of a new vessel, the *Sandcraft*, which was also in only part time operation last year, and which will make possible a very large increase in the company's business. With the full time operation of both of these capital assets during 1925, the net earnings of the company for the current year are estimated at $190,000. This estimate includes part time operation of a new vessel similar to the *Sandcraft* now under construction and to be delivered to

the company about July 1. For 1926 with full time operation of all of the company's new capital assets, the net earnings of the company are estimated at $275,000.

SECURITY: These bonds are secured by a direct first closed mortgage upon all of the principal fixed assets of the company, including sand deposits at Gary, Ind., gravel deposits and plants and dock at Bass River, Ferrysburg and Grand Haven, Mich., and floating equipment consisting of two tugs, a large dredge and four modern self unloading vessels, the *Barth*, the *Hennepin*, the *Sandcraft* and the *Sandmaster*. Funds for the completion of the last named vessel, now being completely rebuilt and refitted by the Interlake Engineering Co. of Clevcland, will be deposited with and distributed by the trustee.

The company's four vessels, including the *Sandmaster*, when completed according to plans and specifications, have been appraised by H. N. Herriman, naval architect and engineer of Cleveland, Ohio, as worth $1,275,000, and the other fixed assets of the company have been appraised by the American Appraisal Co. at a sound value of $693,578. The total appraised value of both is $1,968,578, over 260% of this bond issue.

GENERAL INFORMATION: Sand is a basic commodity, is used as a raw material by many different kinds of industries and is the cheapest and best product for a wide variety of uses. It is used in large quantities for building construction, street paving and road building and by foundries in making cores for castings and by railroads. In recent years it has come to be used in ever increasing quantities for the making of sand fills in reclaiming submerged land on the shores of the Great Lakes and tributary waterways and for the raising of low lands adjacent to the lake shore. Water front land in large cities and in industrial centers of the Great Lakes region is becoming increasingly valuable and greatly in demand for industrial expansion, harbor facilities, parks, drives, bathing beaches and for many other purposes. Manufacturing plants located on the water front find it cheaper and more convenient to fill in submerged land adjacent to their plants than to build new plants or extensions elsewhere. Crowded cities find it cheaper and much more convenient to fill in lake land for beaches, parks, boulevards and other municipal improvements than to condemn or purchase area within the city proper.

In Chicago, already the largest consumer of sand in the United States, the use of sand for sand fills both by industrial plants and for municipal improvements has increased tremendously in the past few years. The South Park Commissioners, in connection with the South Park lake front development, are now engaged in reclaiming a very large area of submerged land along the lake shore extending from Grant Park to Jackson Park, a distance of eight miles. This project alone will probably require over 40,000,000 cu. yd. of material, which, based upon the present capacity of producers, it is estimated will take over 10 years to supply.

Canada Cement Shows Good Business Record

By Roy Carmichael
Montreal, Que.

PROMINENT among the Canadian corporations which successfully completed the transition from munition-making to peace-time business is the Canada Cement Co., Ltd., Montreal, Que.

Canada Cement common advanced from 92½ at the beginning of the year to a high for all time of 106 and is now quoted at 105. Buying is said to have been on the part of those who look not so much to immediate returns, but to the future, and who judge the company's record, not by what it returns to the investor in good times, but what it does in the rougher periods.

The management of the Canada Cement Co. is noted for its most conservative attitude in the matter of showing the profits of the company and this stand has been the means of turning back into the properties considerable sums, especially during certain periods of the war years. This situation is, probably, better reflected in the balance sheet items than in the profit and loss account. It will be noted that while total assets have shown comparatively little fluctuation in the period, being up somewhat over $2,000,000 to $35,166,682, it is in current assets, investments, surplus and reserves that the real strength is to be found. Current assets have risen from $2,833,959 to $10,421,944. At the same time current liabilities have advanced only slightly, from $1,589,539 to $2,365,269. This has allowed of the building up of a most reassuring working capital position. In 1912 the net working capital of the company totaled $1,244,420, while in 1925 it was $8,056,675.

There is little immediate prospect for higher dividends on Canada Cement shares. The company has $5,204,646 of bonds outstanding which mature in 1929, but according to the last annual statement the company has investments of $7,242,023, so it is virtually assured that the bonds will be paid off when due without any new bond issues, the preferred stock will then have a first charge against the company's entire plants and equipment. The revenue that this company will receive during the next few years from investment and other sources is expected to be sufficient to pay the preferred dividends, thus leaving the earnings derived from the cement business all for the common shares.

Sixty per cent of the employes are shareholders of the company and few stocks enjoy such wide distribution, for it is of great importance to note that the floating supply of the common stock is about 7000 shares, a large portion of which is said to be earmarked. The total number of common shares issued is 135,000 shares.

That the Canada Cement shares are backed by heavy-reinvested earnings can be seen by the following table, which indicates that $14,692,552 has been written off during the last 15 years as depreciation:

1910	$ 160,000
1911	130,000
1912	203,000
1913	330,000
1914	435,000
1915	610,000
1916	760,000
1917	*1,170,000
1917	*2,190,616
1918	1,150,764
1919	1,149,584
1920	810,491
1921	815,529
1922	1,679,929
1923	1,547,273
1924	1,550,366

*Special.

Arundel Corporation Eearnings

A NEW record high for all time of 30 was reached by Arundel Corporation stock on the Baltimore Stock Exchange on June 22 in response to the May earnings statement showing that the company had earned within $11,000 of a full year's dividend requirements during **the** first five months.

The volume of transactions in this issue considerably eclipsed that of any other stock on the local market, a total of 1690 shares changing hands.

Net income for May after depreciation totaled $233,000, an average of approximately $80,000 over the same month last year. May net income was $82,000 in excess of a full quarter's dividend requirements, while net of $589,654 for the five months ended May 31 compares with a full year's dividend requirements of $600,000.

Profit and loss surplus at the end of May stood at $1,075,804 after deduction of the first quarter's dividend payment.

Declare Regular Dividend

As was generally expected in the local financial district, the directors of the corporation declared only the regular quarterly dividend of 30 cents a share on the no par capital stock payable July 1 to stockholders of record June 25.

June business of the corporation is continuing to hold up in a highly satisfactory manner, Frank A. Furst, chairman of the board, said. Contracts on the books are sufficient to keep all the enlarged plants of the company working at capacity during the remaining months of 1925 and well into 1926. Should final permission be granted the Philadelphia Electric interests to proceed with the Conowingo project, as planned, this will mean a substantial addition to the unfilled orders of the Arundel Corporation.—*Baltimore Sun.*

Editorial Comment

Probably Chicago is well advertised as in the midst of a particularly active building season. It is. The natural inference would be that this means good business for sand and gravel producers. It does not. With demand and production in excess of any previous year they are in the midst of an absolutely rotten season. It is a strange inconsistency, but not so very difficult to explain.

Inconsistent But True

In the first place, in spite of the size of the market and great growth in demand, the productive capacity of plants serving the Chicago market is at least (according to various estimates) 25% in excess of present demand. The season opened unusually early. The plants were put on a producing basis about a month earlier than usual. They were all early birds and all after the worms.

Apparently the earlier demand was just an aggravation. The season opened early, but the volume of construction did not increase as rapidly as it normally would have done had the season opened later. Many producers, losing patience, began to worry too early about orders; before long they were taking big commitments at low initial season prices. Brokers, who specialize on weak sisters in all industries, speedily took advantage of the situation.

Today sand and gravel is being delivered on the job in the city of Chicago as low or lower than $1.75 per cu. yd., which nets the producer in some cases the munificent sum of 15 or 20 cents a ton f.o.b. producing plant. This, mind you, at the height of a particularly active construction season!

May production of portland cement at 15,503,000 bbl. and shipments of 16,735,000 bbl. are something over 10% better than May, 1924. Car loadings of sand, gravel and crushed stone for the same period show a similar increase. The consumption of high explosives by the quarry and mining industries for April was about 12% more than April, 1924. Automobile production for the first five months of this year was about 1,500,000 cars and 200,000 trucks—approximately the same as 1924, which, as every one knows, was a banner year for the automotive industry. Thus there is evidence of prosperity on every hand, yet unemployment statistics show more idle men at this time than in 1924.

Competition Getting Keener

As prophesied in our annual review number of last December, seasoned operators are steadily but surely paving the way for lower costs and keener competition, notwithstanding the increased demand and increased production. For example, in April of this year, according to statistics of United States Department of Labor, 76 cement plants reported 23,206 laborers employed. One year ago, April, 1924, the same 76 plants employed 24,305 laborers; yet in April, 1925, there were 2,000,000 bbl. more cement produced by the industry than in April, 1924. In other words, 13% more cement was produced by 4.5% fewer men. At the same time the monthly pay roll was decreased from $705,128 to $667,324—a 5.4% cut.

We believe this is typical of what is taking place in well-managed rock products industries. There is no shortage of labor, except in isolated instances. There is enough surplus so that employers can weed out the most inefficient ones; and as near as the editors can learn from interviews with representative employers, this weeding out and selective process is resulting in the marked increase in efficiency evidenced by the figures quoted. Also large investments are being made in labor-saving equipment, bigger, stronger, and more efficient production units, both machines and plants.

There has been no pronounced drop in the general price level, but little bits of information that trickle in, like the Chicago sand and gravel situation above referred to, lead us to believe that there is a general tendency for construction material prices to recede, and that the experienced producer is thoughtfully preparing himself for such eventualities. For example, a lime company announces to their employes: "In order to reduce manufacturing costs to help meet the decline in present market prices of lime, some reduction in rate of pay is necessary at this time. On and after June 7 the rate of bonus will be three cents per barrel for each man on a three-man kiln, and two and one-half cents per barrel for each man on a four-man kiln."

Figures compiled by the National Building Trades Employers' Association show that the cost of construction for the entire country declined 1% in the past month. There was a similar drop in April, indicating that the trend continued downward in rather easy stages. The construction cost index number settled at 204.60 on June 1, which compares with 207.20 on May 7. The average rate for common labor for the entire country was 53 cents an hour on June 1, against 54 cents a month before.

Increasing demand and production and decreasing prices and costs are practically certain evidence that production facilities are overtaking actual and prospective demand, especially such demand as depends on big city building work. It is a time to guard against the general spread of such situations as that which has developed in the Chicago sand and gravel industry.

Limestone Products Plant for Central New York

J. G. White Management Corporation Subsidiary to Operate Southern New York Railway's $200,000 Plant at Jordanville, N. Y.

CONSTRUCTION is now well under way on the new $200,000 limestone products plant of the Southern New York Ry. at Jordanville, N. Y. The plant is being built, according to the Oneonta, N. Y. *Star*, by the Southern N. Y. Ry. but will be operated by the Mohawk Limestone Products Co., a recently incorporated subsidiary of the J. G. White Management Corporation. The main offices of the company are located temporarily at Oneonta, N. Y. A. J. Stratton, general manager of the Southern New York Ry., is vice-president and general manager of the Mohawk company.

The plant will consist of a crushing unit with a capacity of 1000 tons of crushed stone daily, a pulverized limestone unit to produce agricultural limestone, asphalt, filler, etc., and a burned and hydrated lime unit. The crushing plant will be in operation about August 1 and the other plants will be completed and put in operation about October 1.

A large acreage of limestone deposits has been secured and tracks laid from the railway to the plant, a distance of three quarters of a mile.

The quarry will develop a face of 70 ft. Electric power will be used on all loading, crushing and grinding equipment and for hauling. Crushing equipment will consist of one primary, two secondary crushers and a hammer mill. A ball mill will be used to pulverize the fine screenings.

A rotary kiln 8 by 120 ft. using pulverized coal for burning will be installed in the lime plant.

Samples of the limestone have been tested and accepted by the New York State Highway Department for use in all classes of concrete construction. It is claimed that tests show that it will yield a high grade of burned and hydrated lime and agricultural limestone.

Government Officials View "Sentinel of Safety" Trophy

NOTABLE figures in the mining world and representatives of various branches of the Federal Government closely allied with the mining industry gathered in the conference room of the Bureau of Mines in the Interior Department Building Washington, D. C., June 16, for the purpose of viewing the bronze "Sentinel of Safety" trophy.

Dr. H. Foster Bain, Director of the Bureau of Mines, E. C. Finney, acting Secretary of the Interior, James H. MacLafferty, Assistant Secretary of Commerce and William Green, President of the American Federation of Labor all spoke on the merits of and endorsed the idea of safety competition.

Others present at the meeting included J. F. Callbreath, Secretary of the American Mining Congress; N. S. Greensfelder, editor of *The Explosives Engineer;* W. W. Adams, statistician of the Bureau of Mines; Robert J. Grant, Director of the Mint; William Spry, Commissioner of the General Land Office; Charles H. Burke, Commissioner, and E. B. Meritt, Assistant Commissioner, Office of Indian Affairs; E. C. Porter, American Mining Congress; Charles W. Baldwin, and Dr. L. W. Chaney, Bureau of Labor Statistics; and various officials of the Bureau of Mines.

National Crushed Stone Association Membership Campaign Is On

COL. R. "BRINK" TYLER, president of the R. B. Tyler Co., Louisville, Ky., chairman of the membership committee of the National Crushed Stone Association, announces that the "open season" is on, and his committee is lining up for a concerted drive for new members. He is expected to double the membership before the next convention.

So every quarry reader of ROCK PRODUCTS who is not now a member of the Association may prepare himself for an invitation to join and help in the great work which is being planned.

Col. R. B. Tyler of Louisville, Ky., is ready to sign up every quarry operator as a member of the National Crushed Stone Association

Florida Rock Products Company Not Building Cement Plant

THE details of the construction program being conducted by the Florida Rock Products Co., at Brooksville, Fla., as noted in the June 13 issue of ROCK PRODUCTS, were unofficial and in some respects incorrect. The company is not erecting a cement plant. It is, however, building a new washing and crushing plant, designed by Allis-Chalmers Manufacturing Co., which will have a capacity of 5,000 tons daily. Primary crushing will be accomplished with a 36 by 60 in. Fairmount roll crusher and secondary crushing by two 24 by 54 in. Anaconda rolls.

In addition to these plants, a mineral dust plant will be erected, at the same place, with a capacity of 400 tons daily and an Amiesite bituminous paving plant with a daily capacity of 5000 sq. yd. of two-inch pavement.

These improvements will be completed by September 1 and will cost approximately $500,000.

W. L. Porter is president and R. B. Murdock is vice president of the company.

Brilliant Sand Company Buys Two Ohio Quarries

PURCHASE of two silica sand quarries from Mrs. Eli T. Castner has been announced by the Brilliant Sand company, recently incorporated, in the Steubenville, Ohio, *Gazette*. The purchase price was $100,000. The two quarries are located in Brilliant and in Follansbee, Ohio.

The purchase of the two sand quarries includes all the apparatus and equipment for the operation of the quarries.

William A. Tisher is president of the new company. J. W. Driskell, for 12 years general manager of the Castner properties, is in charge of the operations of the Brilliant Sand Co. George B. Clifford is vice-president of the company and W. J. Hukill is secretary-treasurer. Directors of the company are William A. Tisher, W. J. Hukill, George B. Clifford, J. W. Driskell and Charles A. Messersmith. The company was incorporated March 26 for $50,000 and when negotiations for the purchase of the properties of the Castner estate were entered into, the capital investment was increased to $100,000. Offices of the company are located in Steubenville and Brilliant.

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Following Up the Quality Idea

Wisconsin Concrete Products Association Members Capitalize Guaranteed Blocks

By D. R. Collins
Secretary, Wisconsin Concrete Products Association, Milwaukee, Wis.

WHEN the Wisconsin Concrete Products Association started its drive for quality products over two years ago it cast about for some manner in which to impress the public with the idea that members of that organization were turning out a high grade article. True, Mr. Mason Contractor could be told that what he was buying was of high quality and Mr. Architect and Mrs. Homeowner could have the same statement handed them. That alone, however, did not seem to carry the weight it should. Something more convincing had to be created.

Now this matter of quality was not one

Number 104

Wisconsin Concrete Products Association
425 East Water Street, Milwaukee, Wisconsin
Confers this

Certificate of Quality

upon

Acme Block Company

that all men may know by these presents that the above is a manufacturer of quality concrete building units complying with the requirements of the Wisconsin Building Code, tests having been made by an accredited laboratory.

In Witness Whereof, this Certificate of Quality is granted and the signatures of the President and Secretary of the Wisconsin Concrete Products Association are hereunto affixed this 15th day of May, A. D. 1925.

Attest:
Building Engineer,
Wisconsin Industrial Commission

C. O. Gochnauer
President

A. R. Collins
Secretary

1925

Facsimile of "Certificate of Quality" used to promote GOOD concrete blocks in competition with questionable ones

of guess-work. It was based on tests made at an accredited laboratory. Seldom, if ever, had the test sheet, giving the data which showed a quality product was being made, put to work. Our first step was to urge the manufacturers to make use of these sheets—to show them to prospective customers and manufacturers. But most of all, the products man was urged to translate the figures on the sheets so that the layman could understand them.

Translating Test Figures to Popular Language

"One thousand pounds per square inch gross cross-sectional area" meant little to the average builder. But when this was translated into terms of tons, an individual unit would hold, and further amplified by comparison with some familiar object like a Pullman car the figures aroused instant comment and made a lasting impression. The Pullman car example is given because it was the most used by the manufacturers. Association members were then urged to use the tests as a text for local newspaper advertising. Manufacturers who advertised but once or twice a year in their local newspapers were quick to see that a bigger splurge could be made about this test than any one individual point in the manufacture of their product.

Up to a year ago Wisconsin members had been furnished, when complying with certain tests, Certificates of Quality by the Concrete Products Association (National). But having a common standard of quality set by the Wisconsin Building Code, the association felt that a greater and more lasting benefit could be accrued if their own certificate could be issued and validated by the state building engineer, W. C. Muehlstein.

Certificates of Quality That Mean Quality

Mr. Muehlstein had been closely watching the efforts of the association to build up quality and, when he felt certain that this body of concrete products manufacturers was sincere in its efforts to elevate quality, agreed to validate Certificates of Quality issued by the Wisconsin association. These certificates were based on tests, made on products picked at random from stock and carried out in an accredited laboratory. Test sheets from the laboratory were necessary before the certificate was signed. Practically all of the units were selected by the writer and the following conditions imposed previous to the issuance of a certificate:

1. Certificates will be based on tests of standard products selected by the secretary of the Wisconsin Concrete Products Association, his duly authorized representative or a representative of the Wisconsin Industrial Commission or local building department.

2. Specimens must be tested at an accredited testing laboratory at an age of 28 days and pass the requirements of the Wisconsin Building Code.

3. Certificate of Test bearing the signature of the head of laboratory in question must be furnished the Wisconsin Concrete Products Association before a Certificate of Quality is issued.

4. Continuance of the quality shown by the above tests must be maintained by the products manufacturer. Failure to maintain this quality means a revocation of the certificate.

5. All certificates issued will expire at the end of the membership year.

"Backed by the State of Wisconsin," read the copy for the direct mail circular, which went on to say that, "Mr. Muehlstein's signature on this document signifies that the manufacturer to whom it is issued is producing concrete masonry units that have met or exceeded the exacting requirements of the Wisconson State Building Code."

The "Follow Up"

But, as every lane has its turning, so must every project of this sort have its follow-up if it is to be successful. "Follow-up is perhaps the most overworked word in the advertising business," an advertising friend recently told the writer. "Yes, it is an absolute necessity if advertising and merchandising of a product is to be put across successfully." So for the follow-up on the Certificate of Quality a Guarantee of Quality was issued. This guarantee is approximately the size and color of a $20 bill. The bright orange ink used in its embossing is indeed impressive.

WISCONSIN CONCRETE PRODUCTS ASSOCIATION

Guarantee of Quality

CONCRETE BUILDING UNITS FURNISHED ON YOUR JOB AT 125 MAIN ST.[illegible] WERE MANUFACTURED BY THE UNDERSIGNED MEMBER OF THE WISCONSIN CONCRETE PRODUCTS ASSOCIATION, HOLDING CERTIFICATE OF QUALITY NO. 000 . THESE BUILDING UNITS ARE GUARANTEED TO COMPLY WITH ALL REQUIREMENTS OF STATE AND LOCAL BUILDING CODES.

(SIGNED) BLANK CONCRETE PRODUCTS COMPANY

Guarantee used by Wisconsin producers who hold "Certificates of Quality"

6. Certificates of Quality are issued only to members in good standing of the Wisconsin Concrete Products Association.

7. In cases of concrete products other than concrete building units, issuance of the Certificate of Quality is based on standards of the American Concrete Institute, or of the American Society for Testing Materials, and will be issued accordingly.

Pride in Product

That the Wisconsin certificate made an instant hit with the products manufacturers is needless to say. The calls to select block for tests that would accord the manufacturer a certificate were so numerous that they were difficult to handle. Above all, the certificate did one thing that was not expected—it gave the manufacturer a sense of pride in his own product. Each certificate was sent out framed, ready to hang on the office wall, and was judged by the manufacturer as his badge of respectability in the products business. Some of the men carried them along on selling trips—others had cuts made and used them as newspaper and direct mail advertisements. The association made use of the certificate idea in a direct mail campaign to 2300 prospective purchasers of concrete products.

These guarantees are issued in books of 50 to each member of the Wisconsin Concrete Products Association holding a Certificate of Quality. It is intended that they be sent to Mr. Architect and Mr. Owner rather than distributed haphazardly to mason contractors who buy the products for a great majority of jobs. This guarantee the association feels is a real follow-up of the Certificate of Quality and one which will command respect for the manufacturer that sends it out. With it the manufacturer is urged to send a personal letter reading somewhat as follows:

"Mr. John Doe,
1419 Grand Street,
Milwaukee, Wis.

Dear Sir:

Concrete products manufacturers of Wisconsin belonging to the Wisconsin Concrete Products Association have received nation-wide publicity on the strides they have made in improving the quality

products in this state. I am glad to say that this firm has played its part in this improvement and has been awarded a Certificate of Quality by the association because of it.

The concrete building units furnished on your job at ———— are of a quality guaranteed to comply with all state and local building codes and it is our pleasure to enclose our Guarantee of Quality.

Yours very truly,

JOHN DONE.

P. S.—Perhaps you've noticed our units are a little rougher and coarser looking in texture. That's because we're crowding coarser stone and more water into them to give you a sturdier, denser block."

Here in Wisconsin we believe we have a higher quality of products than in any like organization in the United States. It has taken work to build up this quality, but our pride in our product has expanded to such an extent as this building process progressed that it is doubtful if members of the Wisconsin Concrete Products Association ever revert back to the slipshod methods so prevalent before the advent of the Certificate and Guarantee of Quality.

Double Cement Block Production for 1925 Expected

OMAHA reports that all the block plants are getting ready for *double production* this summer and with the present prospects chances are good for an annual production of over 6,000,000 block in 1925. (This is Omaha's production quota for 1925 for a national production of a billion block.)

From Texas comes the report that concrete products plants operating a total of four automatic tile machines with a daily capacity of 3000 tile each, are negotiating for the purchase of at least five more machines. Present indications are that there will be at least ten or twelve machines in service in the Lone Star State within the next 90 days, each machine producing 3000 tile per day.

From Wisconsin comes the report that the concrete products plants are working full time and are still behind in filling orders.

From Minnesota products men report a very decided increase in sales this spring over the past two years, and are running over time to meet the demand.

From Pasadena, Calif., comes the report that one concrete products plant is running to capacity and that production is sold out for the next six weeks. The Pasadena plant will deliver about 100,000 tile this month.

These reports are representative of the reports received throughout the United States and Canada. Almost everywhere plants have doubled their production. With continued effort by every one throughout the year the concrete masonry unit production will double last years' output.—*Concrete Products News* of the Ohio Concrete Products Association.

Suggestions for Cement Products Manufacturers

THE third and revised edition of the book "Plans for Concrete Houses," published by the Portland Cement Association, is now available. Thirty architects have prepared plans for forty modern homes ranging in size from 4 to 7 rooms, which are illustrated in this book. Much attention has been given to construction work, the proper methods of construction being plainly described and made clear by the liberal use of photographs and drawings. The book contains 79 pages of plans, homes and descriptive material, is beautifully printed in colors on high grade paper and is bound in permanent board covers. Copy of this new book may be obtained by sending your check or money order for $1.00 to the Portland Cement Association, 16 E. Broad street, Columbus, Ohio.

Market in Havana for Concrete Building Blocks

(Consul A. C. Frost, Havana)

MATERIALS entering into the construction of concrete blocks are selling in the local market as follows: Cement, manufactured locally, $3.75 per bbl., less 40 cents for the return of empty sacks; sand, $2 to $2.25 per cubic meter; gravel, of which very little is used, $2 to $2.20 per cubic meter; crushed rock, $1.75 to $1.85 per cubic meter.

The average wages of laborers in similar lines of work is from $2 to $2.20 per day.

Owing to the large number of clay deposits scattered throughout the island from which bricks can be made, they constitute the preferred building material of the native Cuban. The advantage of bricks as building material has been further enhanced by the high cost of transporting building materials within the republic, very short hauls only being necessary to get this class of building material to point of operation due to the large number of brick factories situated in various parts of the country.

While some few concrete blocks have been used in Havana and suburbs, it is stated by contractors that the amount used was small, and that in the majority of cases these blocks were made to order for particular undertakings. The larger proportion of the buildings now being erected are of the straight concrete construction type.

Several contractors stated that, owing to a recent strike by laborers in the brick industry, operations on a number of buildings in the course of construction had to be suspended on account of the shortage of bricks, and that they had made concrete blocks to take the place of bricks with satisfactory results respecting cost and performance. Locally made bricks are selling in Havana at $28 to $30 per 1000, and contractors claimed that they had made concrete blocks during the strike which in the aggregate cost less than the bricks.

It is said by local contractors that there is a potential market in Havana and suburbs for 3000 to 4000 concrete blocks daily. However, it is thought that considerable propaganda work would be necessary to create a steady demand for this class of building material in commercial quantities.

There is at present only one cement plant of any importance operating in the island, which is situated at Mariel, Province of Pinar del Rio, about 32 miles from Havana. It is thought the best situation for a plant manufacturing cement blocks would be in the vicinity of Havana, the largest potential market, rather than at the source of cement supply, due to the high cost of inland transportation.

During the past two years the city of Havana and the republic as a whole have been the scene of the greatest building activity ever witnessed in the island. It is the opinion of some that the point of saturation has been reached, while others say this point is still far removed. There is no particular season for building, although this activity may be somewhat retarded during the periods when the rainfall is unusually heavy.

At present approximately 25 factories exist in the city of Havana and suburbs having facilities for the manufacture of concrete blocks, although a number of them are concerned principally with the manufacture of concrete tiles for roof decks, concrete tanks, ornaments of concrete and other items manufactured from concrete. Several of these companies are owned or controlled by contractors and when concrete blocks are used such contractors have their own source of supply.

The probability of equipping and profitably operating a factory devoted exclusively to the manufacture of concrete blocks would depend in a considerable measure on the length of time necessary to educate Cuban builders of this type of construction in preference to brick, the length of time which the present building boom will continue and the competition which would be encountered, in that two of the largest contracting firms in Havana have plants for manufacturing these blocks.—U. S. Department of Commerce Reports.

The above news item is interesting as showing how concrete blocks are gaining the field in competition with clay products, even where clay products have every natural advantage.—THE EDITOR.

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning June 22:

Central Freight Association Docket

10873. Sand, lake. Muskegon, Mich., to Owosso, Mich. Present, $5.50 per ton; proposed, $2.90 per ton.

10908. Sand and gravel. Urbana, O., to Trinway, O. Present, sixth class rate of 16c; proposed, 90c per net ton.

10909. Crushed stone. Findlay, O., to Santa Fe, Wapakoneta and St. Mary's, O. Present, $1.10 per net ton to Santa Fe, O.; $1.20 per net ton to Wapakoneta and St. Mary's, O.; proposed, 80c per net ton.

10910. Crushed stone. Keeport, Ind., to La-Porte, Ind. Present, $1.27 per net ton per Wabash Ry., I. C. C. 5746; proposed $1.13 per net ton, minimum weight 90 per cent of marked capacity of car except when car is loaded to full visible or cubical capacity actual weight will apply.

10914. Gravel and sand (except blast, engine, finishing, foundry, glass, loam, marl, moulding and silica). Ambridge, Pa., to Economy, Pa. Present, 60c per net ton per P. R. R. I. C. C. F1613; proposed 50c per net ton.

10915. Sand and gravel. Hugo, O., to Akron, Bedford, Ravenna, Brecksville, Canal Fulton, Canton, Cortland, Massillon, Mineral Ridge, Rocky River, Barberton, Chagrin Falls, Sebring, Lorain, Lowellsville, and Ashland, O. Present, sixth class; proposed, to Akron, Bedford, Ravenna, 60c per net ton; to Brecksville, Canal Fulton, Canton, Cortland, Massillon, Mineral Ridge, and Rocky River, O., 80c; to Barberton, Chagrin Falls and Sebring, 70c; to Lorain, Lowellville, 90c; and $1 per net ton to Ashland, O.

10918. Sand and gravel. Minimum weight 90 per cent of marked capacity of car except when loaded to full cubical or visible capacity, actual weight will apply. Ft. Jefferson, O., to Stryker, O. Present, $3.40 per net ton per Agent Jones' Tariff, I. C. C. 941; proposed $1.10 per net ton.

10902. Crushed stone. Minimum weight 90 per cent of marked capacity of car except when loaded to full cubical or visible capacity actual weight will apply from Greencastle, Ind., to Humrick, Ill., Cayuga, Ind., Silverwood, Cates, Mellott, Wingate, New Richmond, Linden and Kirkpatrick, Ind. Present, sixth class rate; proposed, $1.13 per net ton.

10921. Crushed stone. Minimum weight 90 per cent of marked capacity of car except when car is loaded to full cubical or visible capacity actual weight will apply. Carey, O., to Granville, O. Present, sixth class rate in effect; proposed, 90c per net ton.

10922. Crushed stone, Woodville and Gibsonburg to Elmira and Montpelier, O. Present, Woodville to Elmira, 13½ cents; Woodville to Montpelier, 14c; Gibsonburg to Elmira, 14½c; Gibsonburg to Montpelier, 15c; proposed, $1.10 per net ton.

Illinois Freight Association Docket

2775-A. Sand and gravel. Carloads, minimum weight 90 per cent of marked capacity of car, except when loaded to full visible capacity actual weight will apply. From Spring Valley, Ill., to Arlington, Ill. Rates in cents per ton. Present, 75; proposed, 65.

3019-A. Sand and gravel. Carloads, minimum weight 90 per cent of marked capacity of car except when car is loaded to full visible capacity actual weight will apply from Quincy, Ill.

	Rates in cents per net ton	
To	Present	Proposed
Canton, Ill.	151	116
Cuba, Ill.	139	103
Astoria, Ill.	139	103
Frederick, Ill.	139	116
Arenzville, Ill.	151	116
Concord, Ill.	151	116

2740-A. Sand and gravel. Carloads, minimum weight capacity of car from Chillicothe, Ill., to Fairview, Ill. Rates in cents per net ton. Present, none; proposed, 113.

Southwestern Freight Bureau Docket

4939. Stone. From points in Indiana to points in Oklahoma. To amend Item 4601-A of S. W. L. Tariff No. 15-L, naming rates on stone from points in Indiana to points in Oklahoma by adding Quarry Junction Dodgson and Victor, Ind., as points of origin. It is stated that the points as outlined above are also quarries located in the Bedford Bloomington district and as a general proposition are, in other tariffs, grouped with the other quarries named in Item 4601-A of S. W. L. Tariff 15-L.

4996. Cement. From Dewey, Okla., to El Paso, Tex., and points taking same rates. To establish a rate of 45c per 100 pounds from Dewey, Okla., to El Paso, Tex., and points taking same rates. Shippers contend that rates from Dewey, Okla., to El Paso, Tex., should not be higher than from Sugar Creek and Kansas City, Mo.

5014. Cement. From Houston, Tex., to points in Louisiana. To establish a rate of 20½ cents per 100 pounds on cement, carload, as described in S. W. L. Tariff 90-E, from Houston, Tex to points on the O. & G. Ry. in Louisiana. Shippers state that the present class basis on this traffic is prohibitive and will not permit movement.

Edwin Brooker

EDITORS' NOTE

EDWIN BROOKER, who conducts these pages of ROCK PRODUCTS, *was graduated from George Washington University Law School on June 3, with the degree of LL. B., so he is now a full-fledged lawyer as well as a traffic expert of many years' experience. He has handled cases before the Interstate Commerce Commission for the past three or four years.*

However, all traffic cases do not require I. C. C. appearances for settlement, as an interesting instance in which Mr. Brooker acted for the shippers in Chicago illustrates. The points in controversy were state and interstate sand and gravel rates in Indiana and Illinois. For perhaps the first time in history representatives of the I. C. C., the state railroad commissions of Illinois and Indiana, the railways and the shippers sat about a conference table and compiled a schedule of rates acceptable to all.

The controversy arose from an attempt by the railways to increase interstate rates—which rates were subsequently suspended by the I. C. C. on petition of the sand and gravel shippers. Mr. Brooker acted as counsel for the sand and gravel producers.

New England Freight Association Docket

8297. Moulding sand. Minimum weight 90 per cent of marked capacity of car, except when car is loaded to cubical or visible capacity actual weight will apply from Van Hoesen and Brookview, N. Y., to Goshen, N. Y. 10. Reason—To establish same basis as now published from other points in Albany distrit.

8304. Limestone, crude and crushed or ground. Minimum weight 40,000 lb. from Brandon and Middlebury, Vt., to Elmira, N. Y., and Newark, N. J. 22. Reason—Comparable with rates between other points of similar distances.

8337. Moulding sand. Minimum weight 90 per cent of the marked capacity of car, but not less than 40,000 lb. from Elnora, Mechanicsville, Reynolds and Schagticoke, Schuylersville, Scotia, Saratoga Springs, Stillwater, Wayville and Ushers, N. Y., to Milford, Mass. 14½c via B. & M., North Adams, Mass., B. & A. R. R. Reason—To establish a reasonable commodity rate.

Southern Freight Association Docket

20890. Bituminous rock. Carloads, from Garfield, Ky., to Jacksonville, Fla. (or beyond). Present, 468c; proposed, 438c per net ton, same as rate recently published from other points of production in Kentucky.

20906. Lime. It is proposed to establish rates on lime, carloads, from River Front Extension, Tenn., of 147c to Alcoa, Maryville and Vose, Tenn., and 169c per net ton to Walland, Tenn., made in line with rates from Knoxville, Tenn.

20908 Sand. It is proposed to increase the minimum weight on sand from So. Ry. Appalachia Division stations to So. Ry. Knoxville Division stations, to be 90 per cent of the marked capacity of cars, this being the minimum observed in connection with rates on sand, gravel, stone, etc., between points in the Southwest generally.

20915. Sand and gravel. It is proposed to establish a rate of 176c per net ton on sand and gravel, carloads, usual minimum weight, from Montgomery, Ala., and Mitylene, Ala., to Statesboro and Brooklet, Ga., via usual available routes. The proposed rate is the same as that now in effect via the C. of Ga. Ry., from Montgomery, Ala., to Statesboro, Ga.

20924. Marble, crushed, etc. It is proposed to revise the present rate on crushed, ground or pulverized marble, carloads, from Tate, Ga., to interior Eastern points to be the same as in effect on calcite from Cartersville, Ga.

20965. Sand and gravel. Carloads, from Hobbs Island, Ala., to Tuscumbia, Ala. Present, 144 cents on gravel and 149 cents per ton on sand, carloads; proposed, 126 cents per net ton, made by use of the proposed Alabama scale, less 10 per cent for joint line distances.

20970. Sand and gravel. Carloads, from Estill Springs and Sewanee, Tenn., to Rockford, Tenn. Present, 212 cents; proposed, 162 cents per net ton, based on the proposed Georgia scale, less 10 per cent.

20972. Stone or marble, broken or crushed. Carloads, from Brighton, Tenn., to Covington, Ky. Present, 53½ cents per 100 lb. (Class "A"); proposed, 225 cents per net ton, same as in effect to Cincinnati, Ohio.

20982. Sand and gravel. It is proposed to establish reduced rates on sand and gravel, straight or mixed carloads, from Shehaw, Ala., and from Rice, Ala., to stations on the Birm-

ingham & Southeastern Ry., Fort Davis, Ala., to Union Springs, Ala., inclusive. The proposed rate is 80c per ton, carloads, minimum 90 per cent of the marked capacity of car.

21069. Stone, marble or slate, crushed, etc. It is proposed to publish through commodity rates on stone, marble or slate, crushed, broken, or powdered, carloads, from Whitestone, Ga., to Cairo, Ill. Proposed, on stone, etc., broken or crushed, 370 cents per net ton—made by adding to the rate to Humboldt, Tenn., the proportion acceptable to the M. & O. R. R., on powdered stone, 393 cents per net ton, made 23 cents per ton higher than the rate proposed on crushed or broken stone. Proposed rates to apply in lieu of present combination rates.

21081. Limestone or marble, ground or pulverized. Carloads, minimum weight 30 net ton from Bridgeport, Tenn., Buquo, Hot Springs, Fletcher, N. C., Knoxville, Mascot and Strawberry Plains, Tenn., to Laurinburg & Southern R. R. stations. It is proposed to revise present rates on basis of published rate to junction point with the L. & S. R. R. plus proportions acceptable to L. & S. R. R.

21114. Stone. It is proposed to revise the present proportional rates on stone, carloads, as described in Item 780, page 111. Agent. Spedden's I. C. C. 883, from New Albany, Ind., to Carolina Territory, on traffic originating in the Bedford, Ind., District, to represent actual Knoxville combination with rates from Cincinnati, O., a differential of 60 cents per ton under New Albany, Ind., which will have the effect of equalizing both gateways. Statement of present and proposed rates will be furnished upon request.

21123. Slag. It is proposed to establish rate of 40 cents per net ton on slag, carloads, minimum weight 90 per cent of the marked capacity of car, except when cars are loaded to their visible capacity, actual weight will govern, from Ensley and Pratt City, Ala., to Avondale and Birmingham, Ala., applicable intrastate only. The proposed rate to Birmingham is the same as the current rate published for account of the Birmingham Southern R. R., while the suggested rate to Avondale is the same as proposed to Birmingham.

Trunk Line Association Docket

12621. To cancel commodity rate on crushed stone and screenings, carloads, from Waterloo, N. Y., to various stations on the L. V. R. R. as shown in L. V. R. R., I. C. C. No. C-7836. Classification basis to apply. Reason for this proposal—account no movement. Therefore rates are obsolete.

Western Trunk Line Docket

2663-B. Stone, artificial. Carloads between points in Kansas. Rates and description. Present, as per item 432, Sup. to W. T. L. Tariff 146-C; proposed, to include in Item 432 "Artificial Stone Rates Class D" in Western Classification at the rates named therein. Carload minimum weight, 40,000 lb.

4642. Stone, crushed. Carloads, from Mildred, Kans., to Kansas City, Mo. Present rate 6½ cents; proposed, 5 cents. Minimum weight, 90% of the marked capacity of car except when actual weight of shipment loaded to full visible capacity is less than 90% of the actual weight will apply, but in no case less than 40,000 lb.

Lack of Written Notice Lifts Demurrage on 165 Cars of Gravel and Stone

AN interesting Interstate Commerce Commission decision holds demurrage charges on carload shipments of various commodities consigned to a paving contractor to have been inapplicable because of lack of written notice as provided by the tariff under which the carrier operates.

This case was argued for a member of the Northwest Branch of the Associated General Contractors of America by Restor E. Johnson, traffic representative of that organization. The decision appears under the head of Campbell Construction Co. vs. La Crosse and Southeastern Railway Co.

Quotations from the decision follow:

"Complainant, a corporation doing a general construction business with headquarters at Minneapolis, Minn., alleges by complaint filed May 21, 1923, that demurrage charges assessed on 165 carloads of sand, gravel, crushed stone, and other commodities received at Viroqua, Wis., from various points during the months of September and October, 1922, were and are unlawful in violation of section 6 of the interstate commerce act. We are asked to award reparation.

"During the period under consideration complainant was constructing a highway near Viroqua, Wis., under contract with the state of Wisconsin. For the convenient handling of inbound carload shipments of material and supplies defendant constructed for complainant at Viroqua a private siding having a capacity of about 10 cars. Complainant's inbound shipments, chiefly of sand and gravel from Winona, Minn., and crushed rock from Lannon, Wis., supplied by complainant, and cement from interstate points supplied by the Wisconsin Highway Commission, moved over defendant's line from LaCrosse, Wis. We have no jurisdiction with respect to the cars which moved intrastate from Lannon.

Cars Accumulated Beyond Private Siding Capacity

"Because of the failure of the highway commission to supply the necessary quantity of cement during the months of September and October, 1922, complainant's operations were delayed, and the resulting accumulation of inbound cars of sand, gravel and crushed rock exceeded the capacity of complainant's siding. The surplus cars were placed on defendant's storage tracks, and demurrage charges were assessed under the average agreement.

"Complainant relies upon the contention that defendant gave no written notice of arrival of the cars or of the fact that they were held and could not be delivered by defendant, and that, therefore, there was no constructive placement.

Oral Notice Was Given as Claimed "According to Custom"

"The evidence shows that complainant's representatives were notified orally by defendant's agent of the daily arrival and accommodation of cars at Viroqua, that upon arrival of the cars expense bills covering freight charges thereon were taken to complainant's office and verified by complainant's representatives, and that written notice was given for cars placed on defendant's storage tracks at Westby, Wis., a point about 7.5 miles north of Viroqua. The record clearly establishes that complainant had actual notice of arrival of cars, and no objection was offered to the method of giving such notice prior to the filing of this complaint. Defendant's witness testified that complainant admitted knowledge of the accumulation of demurrage on the cars held for delivery but preferred to pay demurrage rather than be without the material when needed.

"Defendant contends that although the notice of arrival did not fully comply with the letter of defendant's demurrage rules, the absence of written notice was not the proximate cause of delay in unloading and releasing the cars and did not in any way prejudice the complainant in the premises, and that the giving of oral notice of the arrival of cars was according to a custom and understanding between complainant and defendant.

A Reversal of Previous Decisions

"We have heretofore found that demurrage charges assessed under similar circumstances were applicable and not unlawful. Bartlesville Zinc Co. vs. Director General, 74 I. C. C. 26; International Paper Co. vs. Director General, 74 I. C. C. 34. But we view the doctrine of Davis vs. Henderson ——— U. S. ———, decided October 27, 1924, as controlling. There a shipper of cattle brought an action in a state court for damages against an interstate carrier then under Federal control for failure to furnish a car within a reasonable time after notice. The defense was that the shipper had not complied with the rule, published in a tariff duly filed with us, which provided that orders for cars must be placed with the local agent in writing. Written notice was not given, but plaintiff was permitted to testify that he had notified the station agent orally, and that the agent had accepted his oral notice. The trial court refused to instruct the jury that the shipper could not recover without proving a notice in writing. Complainant obtained the judgment, and it was affirmed by the highest court of the state. The Supreme Court in reversing the judgment, said:

Rule Requiring Written Notice Cannot Be Waived

"There is no claim that the rule requiring written notice was void. The contention is that the rule was waived. It could not be. The transportation service to be performed was that of common carrier under published tariff. The rule was a part of the tariff.

"We find that the demurrage charges assailed were inapplicable; that complainant made the shipments as described and paid and bore the charges herein found inapplicable; that it was damaged thereby in the amount of such charges; and that it is entitled to reparation in the amount thereof, with interest. Complainant should comply with Rule V of the Rules of Practice."—*The Constructor.*

Northwest Interstate Gravel Rate Reduced

A REDUCTION of 12½% in the freight rate on gravel, sand and crushed rock shipped from Melvin, Minn., to Grand Forks, N. D., effective on July 1 has been announced by the Northern Pacific R. R., the rate being reduced in compliance with an order issued in Interstate Commerce Commission Docket No. 14,068.

The rate at the present time is 4 cents a hundred pounds. The new rate, after July 1 will be 3½ cents a hundred pounds.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F. O. B., at producing plant or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Chaumont, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Eastern Pennsylvania	1.35	1.35	1.35	1.35	1.35	1.35
Munns, N. Y.	1.00	1.40	1.30	1.25	.....	.....
Northern New Jersey	1.60	1.50@1.80	1.30@2.00	1.40@1.60	1.40@1.60	.....
Prospect, N. Y.	1.00	1.40	1.40	1.30	1.30	.....
Watertown, N. Y.	.....	.50	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Alton, Ill.	1.85	.....	1.85	.....	.....	.....
Bloomville, Middlepoint, Dunkirk, Bellevue, Waterville, No. Baltimore, Holland, Kenton, New Paris, Ohio; Monroe, Mich.; Huntington, Bluffton, Ind.	1.00	1.10	1.10	1.00	1.00	1.00
Buffalo and Linwood, Iowa	1.00	.....	1.15	.95	1.00	1.00
Chicago, Ill.	.80	1.00	1.00	1.00	1.00	1.00
Columbia, Krause, Valmeyer, Ill.	1.20	1.20	1.20	1.10	1.10	1.10
Cypress, Ill.	1.25	1.15	1.10	1.10	1.10	1.10
Dundas, Ont.	.70	1.05	.90	.90	.90	.90
Gary, Ill.	1.00	1.37½	1.37½	1.37½	1.37½	1.37½
Greencastle, Ind.	1.25	1.25	1.15	1.05	.95	.95
Lannon, Wis.	.80	1.00	1.00	.90	.90	.90
Northern New Jersey	1.30	.....	1.80	1.60	1.40	.....
River Rouge, Mich.	1.00	1.10	1.10	1.10	1.10	1.10
Sheboygan, Wis.	1.10	.....	.....	1.10	1.10	.....
St. Vincent de Paul, Que.	.85	1.35	1.05	.95	.90	.90
Stone City, Iowa	.....	.....	1.20†	1.10	1.05	.....
Toronto, Ont.	1.60	1.95	1.80	1.80	1.80	1.80
Waukesha, Wis.	.90	.90	.90	.90	.90	.90
Wisconsin Points	.50	.....	1.00@1.15	.90@1.05	.90@1.05	.....
SOUTHERN:						
Alderson, W. Va.	.60	1.60	1.60	1.50	1.40	.....
Bridgeport and Chico, Texas.	1.00	1.35	1.25	1.25	1.20	1.10
Cartersville, Ga.	1.65	1.65	1.65	1.35	1.35	.....
El Paso, Texas	1.00	1.00	1.00	1.00	.....	.....
Ft. Springs, W. Va.	.60	1.60	1.60	1.50	1.40	.....
Graystone, Ala.	Crusher run fluxing stone, 1.00 per net ton					
Olive Hill, Ky.	.50@1.00‡	1.00	1.00	1.00	1.00	1.00
Rockwood, Ala.	1.00	.....	.....	1.25	1.00	.....
WESTERN:						
Atchison, Kans.	.25	2.00	2.00	2.00	2.00	1.60‖@1.80
Blue Spr'gs & Wymore, Neb.	.20	1.45	1.45	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25	.....	1.25	1.25	1.10	.....
Kansas City, Mo.	1.00	1.80	1.80	1.80	1.80	1.80
Rock Hill, Mo.	1.50	.....	1.25	1.25	1.25	1.25

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.70	1.45	1.20	1.05	.....
Duluth, Minn.	.90	2.25	1.90	1.50	1.35	1.35
Dwight, Calif.	1.75	1.75	1.75	1.75	1.75	.....
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
New Haven, New Britain, Meriden & Wallingford, Conn.	.80	1.70	1.45	1.20	1.05	1.05
Northern New Jersey	1.50@1.75	2.00@2.25	1.50@1.80	1.40@1.70	1.40@1.60	.....
Oakland and El Cerrito, Calif.	1.75	1.75	1.75	1.75	1.75	.....
San Diego, Calif.	.70e	1.80f	1.60	1.40g	1.30	.....
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	.....
Springfield, N. J.	1.75	2.10	2.10	1.70	1.60	1.50
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley and Red Granite, Wis.—Granite	1.50	1.60	1.35	1.25	1.25	1.00
Coldwater, N. Y.—Dolomite			1.50 all sizes			
Columbia, S. C.—Granite	.50	2.00	1.75	.....	1.60	.....
Eastern Penn.—Sandstone	1.35	1.70	1.65	1.40	1.40	1.40
Eastern Penn.—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Lithonia, Ga.—Granite	1.50@1.75	1.50	1.50	1.25	1.15	1.15
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.—Granite	3.00@3.50	.....	2.00@2.25	2.00@2.25	.....	1.25@2.00
Northern New Jersey (Basalt)	150	2.00	1.80	1.40	1.40	.....
Richmond, Calif. (Basalt)	.75*	.....	1.50*	1.50*	1.50*	.....

*Cubic yd. †1 in. and less. ‡Two grades. ‖Rip rap per ton. (a) Sand. (b) to ¼ in. (c) 1 in., 1.40. (d) 2 in., 1.30. (e) Dust. (f) ¼-in. (g) 2-in.

Agricultural Limestone
(Pulverized)

Alton, Ill.—Analysis, 97% $CaCO_3$, 0.3% $MgCO_3$; 50% thru 4 mesh	4.00
Pulverized	1.85
Asheville, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Branchton, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Cape Girardeau, Mo.—Analysis, 93.5% $CaCO_3$, 3.5% $MgCO_3$; pulverized; 90% thru 50 mesh	1.50
Cartersville, Ga.—Analysis, 68% $CaCO_3$; 32% $MgCO_3$; 50% thru 100 mesh	1.50
Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk	2.50
Chico, Texas—Pulverized	2.50
Colton, Calif.—Analysis, 95% $CaCO_3$, 3% $MgCO_3$—all thru 20 mesh—bulk	4.00
Dundas, Ont., Can.—Analysis, 53.80% $CaCO_3$, 43.31% $MgCO_3$; 35% thru 100 mesh, 50% thru 50 mesh, 100% thru 10 mesh; bags, 4.75; bulk	3.00
Hillsville, Penn.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$, 75% thru 100 mesh; sacked	5.00
Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk	2.50
Knoxville, Tenn.—80% thru 100 mesh, bags, 3.95; bulk	2.70
80% thru 200 mesh, bags, 4.25; bulk	3.90
Linville Falls, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.10; bulk	3.60
Marion, Va.—Analysis, 90% $CaCO_3$, guaranteed; 42.5% thru 100 mesh, 11.3% thru 80, 20.2% thru 60, 22.8% thru 40, 3.2% thru 20 and under or 75% thru 40 mesh; pulverized, per ton	2.00
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 90% thru 100 mesh	3.90@ 4.50
Mountville, Va.—Analysis 76.60% $CaCO_3$, 22.83% $MgCO_3$; 50% thru 100 mesh, 100% thru 20 mesh—125-lb hemp bags	5.00
Olive Hill, Ky.—Analysis, 90% or more $CaCO_3$; pulverized, bags, 4.00; bulk	2.00
Osborne, Penn.—100% thru 20 mesh, 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Piqua, Ohio—Total neutralizing power 95.3%; 99% thru 10, 60% thru 50; 50% thru 100	2.50@ 2.75
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.10; bulk	3.60
99% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Waukesha, Wis.—90% thru 100 mesh	4.00
Watertown, N. Y.—Analysis 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50
West Stockbridge and Rockdale, Mass., Danbury, Conn.—Analysis, 90% $CaCO_3$, 5% $MgCO_3$; pulverized; 50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk	3.25

Agricultural Limestone
(Crushed)

Alderson, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh	1.50
Bedford, Ind.—Analysis, 98.5% $CaCO_3$, 0.5% $MgCO_3$; 90% thru 10 mesh	1.50
Bettendorf, Iowa—97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Blackwater, Mo.—99% $CaCO_3$; 90% thru 4 mesh	1.00
Bridgeport and Chico, Texas—Analysis, 94% $CaCO_3$, 2% $MgCO_3$; 100% thru 10 mesh	1.75
50% thru 4 mesh	1.50

(Continued on next page)

Agricultural Limestone

(Continued from preceding page)

Chicago, Ill.—50% thru 100 mesh; 90% thru 4 mesh	.80
Chico, Texas — 50% thru 50 mesh, 50% thru 4 mesh	1.00
Columbia, Krause, Valmeyer, Ill.—Analysis, 90% $CaCO_3$; 90% thru 4 mesh	1.20
Cypress, Ill.—90% thru 100 mesh	1.25
50% thru 100 mesh, 90% thru 50 mesh, 50% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh	1.15
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh	1.50
Garrett, Okla.—All sizes	1.25
Gary, Ill.—Analysis, approx. 60% $CaCO_3$, 40% $MgCO_3$; 90% thru 4 mesh	.60
Kansas City, Mo.—50% thru 50 mesh	1.25
Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh	2.00
Screenings (¼ in. to dust)	1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$, 32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk	1.60
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 50% thru 50 mesh	1.85@ 2.35
Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind. — Analysis, 42% $CaCO_3$, 54% $MgCO_3$; meal, 25 to 45% thru 100 mesh	1.60
Milltown, Ind. — Analysis, 94.41% $CaCO_3$, 2.95% $MgCO_3$; 30.8% thru 100 mesh, 38% thru 50 mesh	1.45@ 1.60
Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Pixley, Mo.—Analysis, 96% $CACO_3$; 50% thru 50 mesh	1.25
50% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh	1.65
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk	.80@ 1.40
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh	.75
Waukesha, Wis.—Test, 107.38% bone dry, 100% thru 10 mesh; bags, 2.85; bulk	2.10

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk	3.00
Piqua, Ohio, sacks, 4.50@5.00 bulk	3.00@ 3.50
Waukesha, Wis.—97% thru 100 mesh, bulk	4.00

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

Glass Sand:	
Berkeley Springs, W. Va.	2.25
Cedarville and S. Vineland, N. J.—Damp	1.75
Dry	2.25
Cheshire, Mass: 6.00 to 7.00 per ton; bbl.	2.50
Columbus, Ohio	1.25
Estill Springs and Sewanee, Tenn.	1.50
Franklin, Penn.	2.00
Gray Summit and Klondike, Mo.	1.75@ 2.00
Los Angeles, Calif.—Washed	5.00
Mapleton Depot, Penn.	2.00@ 2.25
Massillon, Ohio	3.00
Mineral Ridge and Ohlton, Ohio	2.50
Oceanside, Calif.	3.00
Ottawa, Ill.—Chemical and mesh guaranteed	1.50
Pittsburgh, Penn.—Dry	4.00
Damp	3.00
Red Wing, Minn.: Bank run	1.50
Ridgway, Penn.	1.90
Rockwood, Mich.	2.75@ 3.25
Round Top, Md.	2.25
San Francisco, Calif.	4.00@ 5.00
St. Louis, Mo.	2.00
Sewanee, Tenn.	1.50
Thayers, Penn.	2.50
Utica, Ill.	1.00@ 1.25
Zanesville, Ohio	2.50
Miscellaneous Sands:	
Aetna, Ind.: Core, Box cars, net, .35; open-top cars	.30
Albany, N. Y.: Molding fine and coarse	2.00
Brass molding	2.25
Sand blast	3.60
Arenzville and Tamalco, Ill.: Molding fine and coarse	1.40@ 1.60
Brass molding	1.75
Beach City, Ohio: Core	1.75

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, f. o. b. producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge & So. H'g'ts, Penn.	1.25	1.25	1.15	.85	.85	.85
Attica and Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95	.85	.85	.85	.85
Erie, Penn.		1.25		1.50	1.75	
Farmingdale, N. J.	.58	.48	1.05	1.20	1.10	
Hartford, Conn.	.65*					
Machias Jct., N. Y.		.75	.75	.75	.75	.75
Montoursville, Penn.	1.00	1.10	.90	.85	.85	.85
Northern New Jersey		.50	1.00@1.50	1.00@1.25	1.00@1.25	
Olean, N. Y.		.90	.75	.75	.75	.75
Shining Point, Penn.			1.00	1.00	1.00	1.00
South Heights, Penn.	1.25	1.25	.85	.85	.85	.85
Washington, D. C.—Rewashed, river	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Algonquin and Beloit, Wis.	.50	.40	.60	.60	.60	.60
Attica, Covington and Summit Grove, Ind.	.60@ .85	.60@ .85	.75@ .85	.75@ .85	.75@ .85	.75@ .85
Barton, Wis.		.60	.80	.80	.80	.80
Chicago, Ill.	1.35‡	1.75‡	1.75‡	1.75‡	1.75‡	1.75‡
Columbus, Ohio	.75	.75	.75	.75	.75	.75
Des Moines, Iowa	.50	.40	1.50	1.50	1.50	1.50
Eau Claire, Wis.	.40	.40	.80			.85
Elkhart Lake, Wis.	.60	.40	.60	.60	.60	.60
Ft. Dodge, Iowa	.85	.85	2.05	2.05	2.05	2.05
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Grand Rapids, Mich.		.50		.80	.70	.70
Hamilton, Ohio		1.00			1.00	
Hersey, Mich.		.50				.70
Indianapolis, Ind.	.60	.60		.90	.75@1.00	.75@1.00
Janesville, Wis.		.65@ .75			.65@ .75	
Mason City, Iowa	.45@ .55	.45@ .55	1.35@1.45	1.45@1.55	1.40@1.50	1.35@1.45
Mankato, Minn.		.40	.40a		1.25	
Milwaukee, Wis.		1.01	1.21	1.21	1.21	1.21
Minneapolis, Minn.*	.35	.35	1.35	1.25	1.25	1.25
Moline, Ill.	.60@ .85	.60@ .85	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Northern New Jersey	.45@ .50	.45@ .50		1.25	1.25	
Palestine, Ill.	.75	.75	.75	.75	.75	.75
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
Terre Haute, Ind.	.75	.60	.90	.90	.85	.85
Wolcottville, Ind.	.75	.75	.75	.75	.75	.75
Waukesha, Wis.		.45	.55	.60	.65	.65
Winona, Minn.	.40	.40	1.25	1.10	1.00	1.00
Yorkville, Sheridan, Oregon, Moronts, Ill.			Average .60			
Zanesville, Ohio.	.70	.60	.60	.60	.90	.90
SOUTHERN:						
Charleston, W. Va.	1.35			1.47	1.47	1.47
Chehaw, Ala.	00@ .30		.40	.50		
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.00
Macon, Ga.		.50		.65	.65	
New Martinsville, W. Va.	1.00	.90		1.30a		.90
Roseland, La.	.45	.40	1.75	1.25	1.00	1.00
Smithville, Texas		.90	.90	.90	.90	.75
WESTERN:						
Baldwin Park, Calif.	.20	.20	.40	.50	.50	
Kansas City, Mo.	.80	.70				
Los Angeles, Calif.	.50	.50	.92	.92	.92	
Los Angeles District (bunkers)†	.80	1.30	1.30	1.30	1.30	1.30
Pueblo, Colo.	1.10*	.90*		1.60*		1.50*
San Diego, Calif.		.60	1.25	1.20	1.00	1.00
Seattle, Wash. (bunkers)	1.50*	1.50*	1.50*	1.50*	1.50*	1.50*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.			Dust to 3 in., .40			
Boonville, N. Y.	.60@ .80		.55@ .75			1.00
Chehaw, Ala.	00@ .30					
Des Moines, Iowa		Washed, .65; unwashed, .40 (not screened)				
Dudley, Ky. (crushed silica)	1.10	1.10	.90	.90		
East Hartford, Conn.			Sand, .75 per cu. yd.			
Elkhart Lake, Wis.	.50					
Gainesville, Texas		.95				.55
Grand Rapids, Mich.				.60		
Hamilton, Ohio					.70	
Hersey, Mich.				.55		
Indianapolis, Ind.			Mixed gravel for concrete work, .65			
Lindsay, Texas		1.10				.55
Macon, Ga.		.35				
Mankato, Minn.			Pit run gravel, .50			
Moline, Ill. (b)	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Montezuma, Ind.						.60
St. Louis, Mo.			Mine run gravel 1.55 per ton			
Shining Point, Penn.			Concrete sand, 1.10 ton			
Smithville, Texas	.50	.50	.50	.50	.50	.50
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.	.60	.60	.60	.60	.60	.60
York, Penn.	1.10	1.00				
Zanesville, Ohio						.55

*Cubic yd. †Include freight and bunkerage charges. ‡Delivered on job. (a) ¾ in. down. (b) River run.

Miscellaneous Sands

(Continued from preceding page)

Furnace lining		2.50
Molding fine and coarse		2.00
Traction unwashed and screened		1.75
Cheshire, Mass.—Furnace lining, molding fine and coarse		5.00
Sand blast	5.00@	8.00
Stone sawing		6.00
Columbus, Ohio:		
Core	.30@	1.50
Traction	.30@	.90
Molding coarse	1.25@	1.75
Furnace lining	1.75@	2.50
Stone sawing	1.25@	1.50
Brass molding	2.00@	2.50
Sand blast	3.50@	4.00
Molding fine	2.00@	2.25
Eau Claire, Wis.:		
Sand blast		3.00
Traction		.65
Elco, Ill.:		
Ground silica per ton in carloads	22.00@	31.00
Elnora, N. Y.:		
Brass molding	1.75@	2.00
Estill Springs and Sewanee, Tenn:		
Molding fine and core		1.25
Roofing sand, sand blast, traction	1.35@	1.50
Franklin, Penn.:		
Furnace lining, molding fine and coarse		1.75
Core		2.00
Gray Summit and Klondike, Mo.:		
Stone sawing		1.00
Core, furnace lining, molding fine, roofing sand		1.75
Brass molding	1.75@	2.00
Sand blast		2.00
Joliet, Ill.:		
No. 2 molding sand; also loam for luting purposes and open-hearth work	.65@	.85
Kasota, Minn.:		
Stone sawing		1.00
Mapleton Depot, Penn.:		
Molding fine, traction		2.00
Roofing sand		1.50
Massillon, Ohio:		
Molding fine, coarse, furnace lining core and traction		2.50
Michigan City, Ind.:		
Core, in open car, .30; in box car		.40
Mineral Ridge and Ohlton, Ohio:		
Molding fine and coarse, traction, furnace lining, all green		1.60
Core, roofing sand, sand blast, all green		1.75
Montoursville, Penn.:		
Traction		1.10
Core	1.35@	1.50
New Lexington, Ohio:		
Molding fine		2.00
Molding coarse		1.50
Oceanside, Calif.:		
Roofing sand		3.50
Ottawa, Ill.:		
Core, furnace lining, molding coarse, roofing sand, traction, brass molding		1.25
Molding fine		2.50
Stone sawing		3.00
Sand blast		4.00
Red Wing, Minn.:		
Core, furnace lining, stone sawing		1.50
Molding fine and coarse, traction		1.25
Sand blast		3.50
Filter sand		3.75
Ridgway, Penn.:		
Furnace lining, molding fine and coarse		1.50
Core		1.90
Round Top, Md.:		
Core		1.60
Traction		1.75
Roofing sand		2.25
St. Louis, Mo.:		
Core	1.00@	1.75
Furnace lining		1.50
Molding fine	1.50@	2.50

Crushed Slag

City or shipping point		¼ in.	½ in.	¾ in.	1½ in.	2½ in.	3 in.
EASTERN:	Roofing	down	and less	and less	and less	and less	and larger
Buffalo, N. Y.	2.35@2.50	1.35@1.70	1.45@1.80	1.35@1.70	1.35@1.70	1.35@1.70	1.35@1.70
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Emporium and Dubois, Penn.	2.35@2.50	1.35@1.70	1.45@1.80	1.35@1.70	1.35@1.70	1.35@1.70	1.35@1.70
Reading, Pa.	2.50	1.00	.....	1.25	.....	.....	.....
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	2.05	1.45	.....	1.45	.....	1.45†	1.45‡
Jackson, Ohio	.....	1.05	.....	1.30	1.05	.....	1.30‡
Toledo, Ohio	1.50	1.25	1.25	1.25	1.25	1.25	1.25
Youngst'n, O., dist.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.	.....	1.55	.....	1.55	1.55	.....	1.55‡
Ensley and Alabama City, Ala.	2.05	.80	1.25	1.15	.90	.90	.80
Longdale, Roanoke, Ruesens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

*¼ in. to 1¼ in. †¼ in. to 2 in. ‡1½ in. to 3 in.

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing	Masons'	Agricultural	Chemical	Ground burnt lime,		Lump lime,	
EASTERN:	hydrate	hydrate	hydrate	hydrate	Blk.	Bags	Blk.	Bbl.
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.20
Buffalo, N. Y.	.....	12.00	12.00	12.00	.....	.....	.....	.....
Lime Ridge, Penn.	.....	.....	.....	.....	.....	.....	5.00a	.....
West Stockbridge, Mass.	.....	10.50	5.60	.....	.....	.....	.....	2.25m
Williamsport, Penn.	.....	.....	10.00	.....	.....	.....	6.00	.....
York, Penn.	.....	10.50	10.50	11.50	.....	.....	8.50	1.65i
CENTRAL:								
Cold Springs, Ohio (f)	12.50	10.00	10.00	.....	9.00	11.00	9.00	.....
Delaware, Ohio	12.50	10.00	9.00	10.50	10.00	15.00	9.00	1.50
Gibsonburg, Ohio (f)	12.50	10.00	10.00	.....	9.00	11.00	9.00	.....
Huntington, Ind.	12.50@14.50	10.00	9.00	.....	.....	.....	9.00	.....
Luckey, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	.....
Marblehead, Ohio	.....	10.00	9.00	10.00v	.....	.....	9.00	1.50c
Marion, Ohio	.....	10.00	9.00	.....	.....	.....	9.00	1.50c
Sheboygan, Wis.	.....	.....	.....	.....	.....	.....	8.50t	.....
Tiffin, Ohio	.....	.....	.....	.....	9.00	.....	.....	.....
White Rock, Ohio	12.50	.....	.....	.....	9.00	11.00	9.00	.....
Woodville, Ohio (f)	12.50	10.00	9.00	.....	9.00	10.50l	9.00	1.50
SOUTHERN:								
El Paso, Texas	.....	.....	.....	.....	.....	.....	10.00	1.75
Graystone, Ala.	12.50	11.00	.....	10.00	.....	1.35u	8.50	1.50
Karo, Va.	.....	10.00	9.00	.....	.....	.....	7.00g	1.65h
Knoxville, Tenn.	20.50	11.00	.....	.....	.....	1.35	8.00	1.50
Ocala and Zuber, Fla.	13.00	12.00	10.00	.....	.....	1.50	12.00	1.70
Varnons, Ala. (t)	.....	10.00p	10.00p	.....	.....	.....	8.00q	1.40r
WESTERN:								
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	15.00	.....
San Francisco, Calif.	20.00†	20.00†	15.00s	20.00†	.....	.....	.....	2.50o

†50-lb. paper bags, burlap 24.00; (a) run of kilns; (c) wooden, steel 1.70; (d) wood; (e) per 180-lb. barrel; (f) dealers' prices; (g) to 9.50; (h) to 1.75; (i) 180-lb. bbl.; 2.65, 280-lb. bbl.; (l) 80-lb. paper; (m) finishing lime, 3.00 common; (n) common lime; (o) high calcium; (p) to 11.00; (q) to 8.50; (r) to 1.50; (s) in 80-lb. burlap sacks; (t) in bbls.; (u) two 90-lb. bags; (v) bulk.

Miscellaneous Sands

(Continued)

Molding coarse	1.25@	1.75
Roofing sand		1.75
Sand blast	3.50@	4.50
Stone sawing	1.25@	2.25
Traction		1.25
Brass molding	2.00@	3.00
San Francisco, Calif:		
(Washed and dried) — Core, sand blast and brass molding	3.50@	5.00
Furnace lining and roofing sand	3.50@	4.50
Molding fine and traction		3.50
Molding coarse		4.50
(Direct from pit)—Core and molding fine	2.50@	4.50
Sewanee, Tenn.:		
Molding fine and coarse, roofing sand, sand blast, stone sawing, traction, brass molding		1.25
Skerkston, Ont.:		
Traction (lake sand)		.65
Tamms, Ill.:		
Ground silica per ton in carloads	20.00@	31.00
Thayers, Penn.:		
Core		2.00
Molding fine and coarse		1.25
Traction		2.25
Utica, Ill.:		
Core, furnace lining, molding fine (crude and dry)	.60@	1.00
Molding coarse (crude and dry)	.60@	1.25
Traction, roofing sand		1.00
Brass molding	1.00@	1.25
Stone sawing	1.00@	2.75
Sand blast		2.75
Molding fine		.60
Molding coarse	.65@	.70
Core and furnace lining		.75
Utica, Penn.:		
Core		2.00
Molding fine and coarse		1.75
Warwick, Ohio.:		
Core, molding fine and coarse (green)		1.75
Core, molding fine (dry)		2.25
Zanesville, Ohio:		
Molding coarse		1.50
Core, furnace lining, molding fine, brass molding		2.00
Traction		2.50
Molding coarse	1.40@	1.50
Molding fine, brass molding	1.50@	1.75

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:		
Crude talc (mine run)	3.00@	4.00
Ground talc (20-50 mesh), bags		10.00
Cubes		55.00
Blanks (per lb.)		.08
Pencils and steel workers' crayons, per gross		1.25
Chatsworth, Ga.:		
Crude (for grinding)		5.00
Ground talc (150-200 mesh), bags		10.00
Pencils and steel workers' crayons, per gross		1.50
Chester, Vt.:		
Ground (150-200 mesh), bags	9.00@	15.00
Bags	10.00@	11.00
Chicago and Joliet, Ill.:		
Ground (150-200 mesh), bags		30.00
Emeryville, N. Y.:		
(Double air floated) including bags;		
325 mesh		14.75
200 mesh		13.75
Hailesboro, N. Y.:		
Ground (150-200 mesh) bags		18.00
Ground (200-300 mesh) bags		20.00
Henry, Va.:		
Crude (mine run)	3.50@	4.00
Ground (150-200 mesh), bags	9.00@	15.00
Keeler, Calif.:		
Ground (200-300 mesh), bags	20.00@	30.00
Marshall, N. C.:		
Crude	4.00@	8.00
Ground (20-50 mesh), bags extra	6.50@	8.50
Ground (150-200 mesh), bags	8.00@	12.00
Natural Bridge, N. Y.:		
Ground talc (300-325 mesh), bags		13.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

Gordonsburg, Tenn.—B.P.L. 65-72%	4.25@	5.00
Mt. Pleasant, Tenn.—B.P.L. 72%	5.50@	6.00
B.P.L. 75%	6.00@	6.50
B.P.L. 75% (free of fines for furnace use)	6.50@	6.75
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.		5.50
Twomey, Tenn.—B.P.L. 65%, 2000 lb.	7.00@	8.00

(Continued on next page)

Roofing Slate

The following prices are per square (100 sq. ft.) for Pennsylvania Blue-Gray Roofing Slate, f. o. b. cars quarries:

Sizes	Genuine Bangor, Washington Big Bed, Franklin Big Bed	Genuine Albion	Slatington Small Bed	Genuine Bangor Ribbon
24x12, 24x14	10.20	10.00	8.10	7.80
22x12	10.80	10.00	8.40	8.75
22x11	10.80	10.50	8.40	8.75
20x12	12.60	10.50	8.70	8.75
20x10, 18x10, 18x9, 18x12	12.60	11.00	8.70	8.75
16x10, 16x9, 16x8, 16x12	12.60	11.00	8.40	8.75
14x10	11.10	11.00	8.10	7.80
14x8	11.10	10.50	8.10	7.80
14x7 to 12x6	9.30	10.50	7.50	7.80
	Mediums	Mediums	Mediums	Mediums
24x12	$ 8.10	$8.10	$7.20	$5.75
22x11	8.40	8.40	7.50	5.75
Other sizes	8.70	8.70	7.80	5.75

For less than carload lots of 20 squares or under, 10% additional charge will be made.

(Continued from preceding page)

Ground Rock

(2000 lb.)

Gordonsburg, Tenn.—B.P.L. 68-72%..	4.00@ 5.00
Mt. Pleasant, Tenn.—B.P.L. 65%.....	6.50@ 7.00
13% phosphorus, 95% thru 80 mesh	5.75
Twomey, Tenn.—B.P.L., 65%.....	7.00@ 8.00

Florida Phosphate

(Raw Land Pebble)

Per Ton

Florida—F. O. B. mines, gross ton, 68/66% B.P.L., Basis 68%.....	2.50
70% min, B.P.L., Basis 70%.....	2.75
72% min. B.P.L., Basis 72%.....	3.00
75/74% B.P.L., Basis 75%.....	4.00

Fluorspar

Fluorspar, 85% and over calcium fluoride, not over 5% silica, per net ton, f.o.b. Illinois and Kentucky mines	17.50@18.00
Fluorspar, foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Philadelphia, duty paid, per net ton	18.00
Fluorspar, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, per net ton, f.o.b. Illinois and Kentucky mines	32.50

Special Aggregates

Prices are per ton f. o. b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco chips
Barton, Wis., f.o.b. cars		10.50
Brandon, Vt.‡—English cream	11.00	11.00
English pink	11.00	11.00
Chicago, Ill.—Stucco chips, in sacks f.o.b. quarries		17.50
Crown Point, N. Y.—Mica Spar		8.00@10.00
Easton, Penn., and Phillipsburg, N. J.—Green		5.00@ 7.00
Haddam, Conn. — Felstone buff	15.00	15.00
Harrisonburg, Va.—Blk marble (crushed, in bags	†12.50	†12.50
Ingomar, Ohio (in bags)		12.00@20.00
Middlebrook, Mo.—Red		20.00@25.00
Middlebury, Vt.‡—Middlebury white	11.00	11.00
Milwaukee, Wis.		14.00@34.00
Newark, N. J.—Roofing granules		7.50
New York, N. Y.—Red and yellow Verona		32.00
Red Granite, Wis.		7.50
Sioux Falls, S. D.	7.50	7.50
Stockton, Cal. — "Natrock" roofing grits		*12.00
Tuckahoe, N. Y.		12.00
Villa Grove, Colo.		13.00
Wauwatosa, Wis.		16.00@45.00
Wellsville, Colo.—Colorado Travertine Stone	15.00	15.00

†C.L. Less than C. L., 15.50.
‡C.L. lots, for L.C.L. add 3.50 per ton.
*Including sacks.

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00@35.00
Baltimore, Md. (Del. according to quantity)	16.00@16.50	22.00@50.00
Ensley, Ala. ("Slagtex")	12.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Friesland, Wis.	22.00	32.00
Milwaukee, Wis.	14.00	30.00@42.00
Omaha, Neb.	18.00	30.00@40.00
Philadelphia, Penn.	15.25	21.50
Portland, Ore.	19.00	25.00@55.00
Prairie du Chien, Wis.	14.00	25.00@32.00
Rapid City, S. D.	18.00	25.00@45.00
Watertown, N. Y.	18.00@21.00	35.00@37.50
Wauwatosa, Wis.	14.00	20.00@42.00
Winnipeg, Man.	14.00	22.00

Sand-Lime Brick

Prices given per 1000 brick f. o. b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass.	14.00@15.50
Brighton, N. Y.	16.75
Dayton, Ohio	12.50@13.50
Farmington, Conn.	14.00
Grand Rapids, Mich.	12.00
Hartford, Conn.	14.00
Jackson, Mich.	13.00
Lancaster, N. Y.	13.00
Michigan City, Ind.	12.00
Milwaukee, Wis.	13.00
Portage, Wis.	15.00
Rochester, N. Y. (del. on job)	19.75
Saginaw, Mich.	13.00
San Antonio, Texas	13.00@13.50
Syracuse, N. Y.	*20.00
Terra Cotta, D. C.	13.50
Wilkinson, Fla.—White	13.00
Buff	17.00

*Mill price, $22.00 delivered.

Gray Klinker Brick

El Paso, Texas	13.00

Lime

Warehouse prices, carload lots at principal cities.

	Hydrated, Finishing	per ton Common
Atlanta, Ga.	22.50	14.00
Baltimore, Md.	24.25	17.85
Boston, Mass.	20.00	14.00@15.00
Cincinnati, Ohio	16.80	14.30
Chicago, Ill.	20.00	18.00
Dallas, Tex.	20.00	——
Denver, Colo.	24.00	——
Detroit, Mich.	15.50	15.50
Kansas City, Mo.	19.50	18.50
Los Angeles, Calif.	——	18.00
Minneapolis, Minn. (white)	25.50	21.00
Montreal, Que.	——	21.00
New Orleans, La.	24.00	16.00
New York, N. Y.	18.20	12.00@13.10
Philadelphia, Penn.	23.00	16 00
St. Louis, Mo.	23.00	19.00
San Francisco, Calif.	——	22.00
Seattle, Wash. (paper sacks)	24.00	——

Portland Cement

Prices per bag and per bbl. without bags net in carload lots.

	Per Bag	Per Bbl.
Boston, Mass.	——	1.81
Buffalo, N. Y.	——	1.77
Cedar Rapids, Iowa	——	2.44
Cincinnati, Ohio	——	2.47
Cleveland, Ohio	——	2.39
Chicago, Ill.	——	2.20
Columbus, Ohio	——	2.44
Dallas, Texas	.48¾	1.95
Davenport, Iowa	——	2.39
Dayton, Ohio	——	2.48
Denver, Colo.	.63¼	2.55
Detroit, Mich.	——	2.25
Duluth, Minn.	——	2.19
Indianapolis, Ind.	——	2.41
Kansas City, Mo.	54¼	2.17
Los Angeles, Cal. (less 5c dis.)	.60	2.60
Louisville, Ky.	——	2.45
Memphis, Tenn.	.65	2.60
Milwaukee, Wis.	——	2.25
Minneapolis, Minn.	.60½	2.42
Montreal, Que.	——	1.90
New York, N. Y.	——	1.77
Omaha, Neb.	.62¼	2.51
Philadelphia, Penn.	——	1.85
Pittsburgh, Penn.	——	2.19
San Francisco, Calif.	.65¼	2.31
St. Louis, Mo.	.57½	2.30
St. Paul, Minn.	——	2.42
Seattle, Wash. (10c bbl. dis.)	——	2.95
Toledo, Ohio	——	2.40

NOTE—Add 40c per bbl. for bags.

Mill prices f.o.b. in carload lots, without bags, to contractors.

	Per Bag	Per Bbl
Buffington, Ind.	——	1.95
Concrete, Wash.	——	2.35
Davenport, Calif.	——	2.05
Hannibal, Mo.	——	2.05
Hudson, N. Y.	——	2.05
Leeds, Ala.	——	1.95
Mildred, Kan.	——	1.95
Nazareth, Penn.	——	1.95
Northampton, Penn.	——	1.95

*Including sacks at 10c each.

Cement Products

Hawthorne tile, carload lots, f.o.b. Cicero, Ill.

	Per sq.
Silver gray	——
Red French	9.50
Green French	11.50
Red Spanish	12.00
Green Spanish	12.00

	—Cicero— Red	Green
Ridges	.25	.35
Hips	.20	.30
Ridge closers	.05	.06
Hip terminals, 3 way	1.25	1.50
Hip starters	.50	.60
Gable finials	1.25	1.50
Gable starters	.20	.30
End bands	.20	.30
Eave closers	.06	.08

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	—Plaster Board— ¼x32x 36". Wt. 1500 lb. Per M Sq. Ft.	⅜x32x 36". Wt. 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48". Lgths. 6'-10', 1850 lb. Per M Sq. Ft.
Centerville, Iowa	3.00	9.00	12.00	8.00	8.00	8.60	11.00	.....	25.80	9.00	.....	.....	.....
Douglas, Ariz.	.....	.....	7.00	.....	16.5e	.....	19.50	.....	.....	15.50	.....	.....	.....
Grand Rapids, Mich.	2.75	6.00	6.00	8.00	9.00	9.00	17.50	.....	26.55	20.00	.....	.....	.....
Gypsum, Ohio‡	3.00	4.00	6.00	8.00	9.00	9.00	18.00	7.00	27.15	17.00	.....	20.00	30.00
Hanover, Mont.	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles, Calif.	.....	.....	.....	10.90b	.....	.....	12.30	.....	.....	.....	.....	.....	.....
Port Clinton, Ohio	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00	.....	20.00	30.00
Portland, Colo.	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
San Francisco, Calif.	.....	.....	.....	.....	16.40	.....	17.40	.....	.....	.....	.....	.....	.....
Sigurd, Utah	.....	.....	.....	.....	.....	.....	.....	.....	18.00a	.....	.....	.....	.....
Winnipeg, Man.	5.50	5.50	7.00	13.50	15.00	15.00	.....	.....	.....	.....	28.50	.....	34.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable).
*To 3.00; †to 11.00; ‖to 12.00; ‡prices per net ton, sacks extra; (a) to 21.00; (b) sacks, 12c each.

New Machinery and Equipment

Gypsum Wall-Board Machine

ALTHOUGH gypsum wall-board has been manufactured for a number of years wall-board machines have not been on the market. In times past each manufacturer of gypsum wall-board has had to design and build his own machines, which he did with as much secrecy as possible. During the past two years the Coe Manufacturing Co., Painesville, Ohio, developed and has installed a number of wall-board drying machines which they put on the market; and now the Buttress Plaster Wall-Board Machinery Co., Los Angeles, Calif., has put on the market a wall-board machine itself.

The manufacturers of this machine are also manufacturers of plaster-board and have developed and patented their machine as have other gypsum manufacturers. This machine can also be designed to manufacture "Rivet Lath," a plaster-board especially designed to be plastered over—taking the place of both wood and metal lath.

The line-cut below illustrates the essential elements of the machine: (1) and (2) the receiving hopper for calcined gypsum and saw-dust (if saw-dust or wood fibre is used); (3) dry mixer; (4) conveyor and mixer where water (5) is added; (7) stucco receiving plate and paper for under side of board; (8) paper for top of board; (10) rolls of paper; (11) smoothing pressure rolls; (13) cut-off saw; (14) and (15) conveyor; (16) and (17) for finishing the edges; (18) taking off the finished board.

This machine is sold under a guarantee to make 75,000 sq. ft. of board in 10 hours of continuous operation; larger machines can be built. Plans and specifications can be furnished so that gypsum manufacturers can build their own machines if this method is preferred.

Especial claims are made for the mixer, which it is claimed will handle a mixture of 50% plaster and 50% saw-dust (by volume).

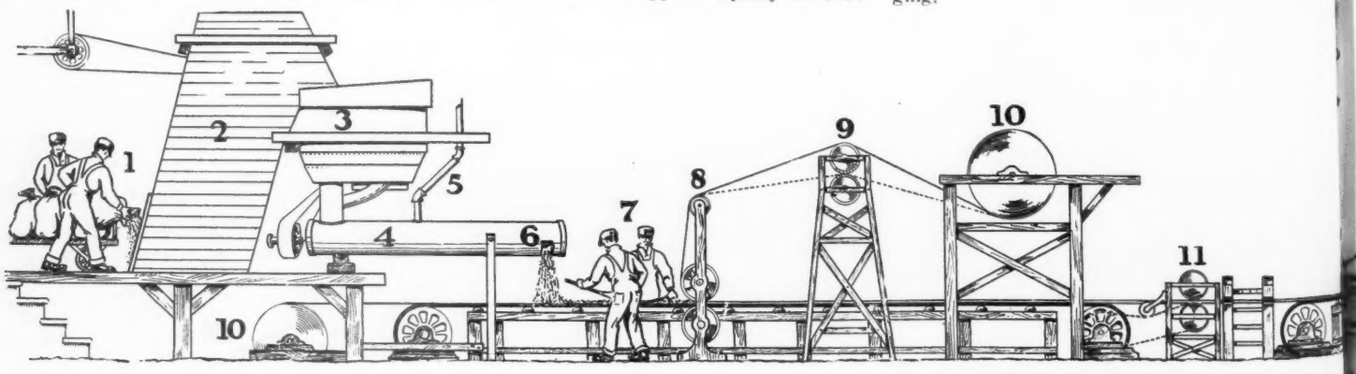
New gas shovel-crane with crane attachment

Brownhoist Gas Shovel-Crane

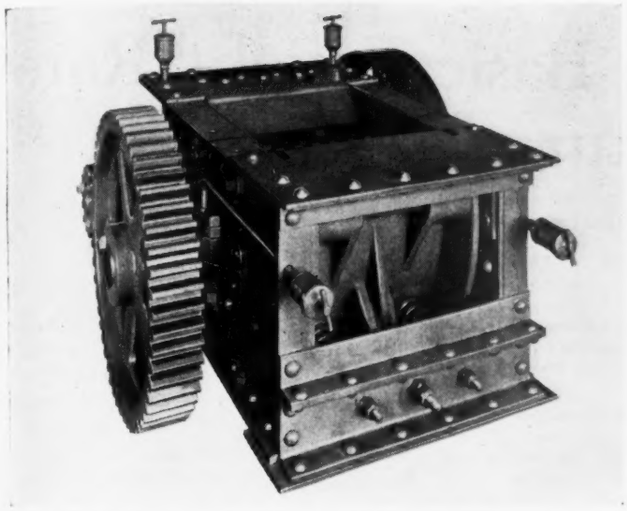
AFTER studying for several years the needs of the various industries using power shovels, the Brown Hoisting Machinery Co., Cleveland, Ohio, has announced a new half-yard capacity gas engine, creeper truck shovel-crane. The features claimed for this machine are its extreme simplicity and accessibility (there being only 18 gears on the entire machine), its pivot steering device and its fast operating speeds and quick convertibility to dipper shovel or clam-shell work.

The pivot steering on this No. 1 Brownhoist is entirely new and makes possible the working of this shovel in narrow quarters, which would otherwise be impossible to get into. Power is applied equally to both creeper belts for steering but the creepers are run in opposite directions. In this way the creepers just change places and the machine pivots around on one point. Steering is controlled entirely from the operator's position and without swinging the boom. This steering is as simple as it is practical, there being nothing on it to get out of order. Only three gears are needed below deck for both steering and traveling.

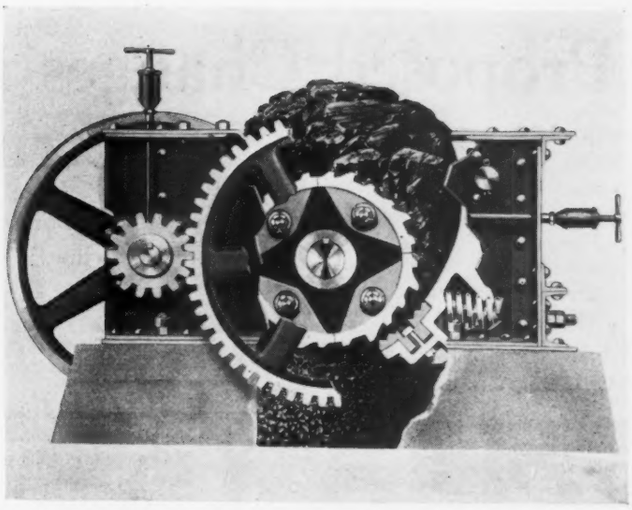
A direct and independent dipper crowd is employed on the shovel which gives the operator a wider and more flexible range on shovel work. The crowding motion, which is of the rope type, is controlled by one lever, and is entirely independent of the dipper hoist. This feature permits the dipper to be crowded in or out even while digging.



A gypsum wall-board manufacturing machine



Strongly built coal crusher for lime and cement plants



Sectional view of new structural-steel frame coal crusher

Coal Crusher for Lime and Cement Plants

WITH the constantly increasing popularity of the single roll type of crusher for stoker coal preparation crushing coal for pulverizers, gas plant use, and other purposes, has come a corresponding demand for utmost dependability of the crusher unit. This type of crusher has been generally accepted as standard, because of its finer and more uniform product, simplicity of construction, low upkeep cost, and greater dependability, says an announcement of the Pennsylvania Crusher Co., Philadelphia, Penn.

In operation coal is fed to the crusher in any quantity desired. The rotating toothed roll draws the coal into the tapered opening between the roll and breaker plate, quickly reducing it to the desired size and discharging it below to the belt, elevator, or direct to the bunkers. The cross-section illustration indicates clearly the operation of the crusher, as well as the spring relief in case of iron in the feed. The natural agitating action of the teeth passing through the coal on top of the roll produces a shaking action which carries the finer pieces of coal in the feed rapidly through the crushing zone with a minimun of crushing, which partly accounts for the low percentage of fines produced in this type of crusher. The size and adjustment of the spring suspension to prevent the yielding of the springs for any except uncrushable materials, accounts for the minimun of oversize.

For average conditions and capacities in power plant work the nearest approach to the ideal coal preparation service rendered by the Bradford breaker on large tonnages, is obtained from the single-roll crusher. Minimum oversize and minimum fines have always been characteristic of this type, and with unbreakable fabricated steel frame construction, in addition to two other safety devices, the danger of break-down from tramp iron in the feed is definitely eliminated.

A segmental roll of special patented construction with no bolts through the crushing surface to weaken the segments, affords greatest strength and provides ready accessibility for changing when necessary.

The frame carries, in addition to the main roll shaft and the countershaft, a pivoted breaker plate which is readily adjustable to and from the crushing roll to vary the size of product as needed. A 1-in. product with little oversize can be supplied for stoker feed or for pulverizers; 6 in. crushing for preparation of coal for hand-fired furnaces is equally possible. Any size between these two limits is easily obtained by means of the breaker plate adjustment.

Triple protection against tramp iron is thus afforded in this crusher, first with the unbreakable steel frame, second with the relief springs, and third with the positive shear pin safety device.

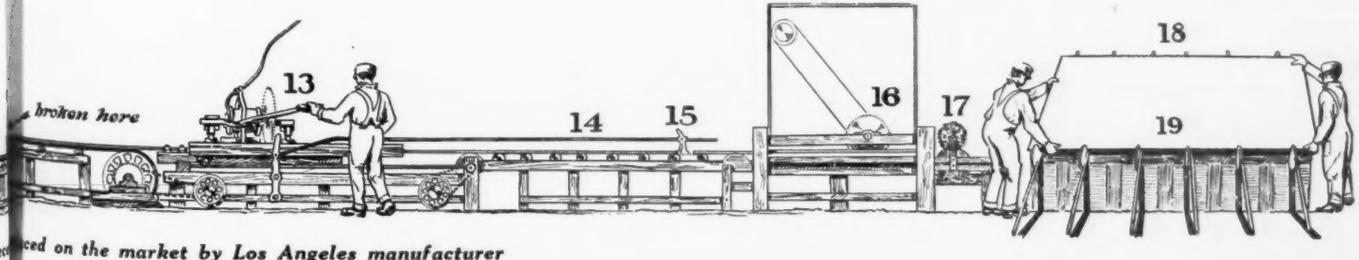
This machine is especially designed for hard service and infrequent attention and lubrication, such as is too often the treatment received in the rock products industry.

Handbook on Superheated Steam

A NEW handbook on the generation and use of superheated steam prepared by the Superheater Co., 17 East 42nd street, New York, entitled "Superheat Engineering Data" has been published.

This handbook contains condensed data for steam power plant engineers and operators. Superheated steam, its advantages over saturated steam and the proper design and performance of superheaters are briefly discussed. It illustrates superheater arrangements in practically all stationary, marine and locomotive type boilers commonly made in America. Waste heat, portable and separately fired superheaters are also shown. Brief comparative data is given as to sizes, tube sizes, arrangement of tubes, etc., for the stationary water tube boilers illustrated. The steam tables cover pressures from below atmosphere to 600 lb., absolute, and include properties of superheated steam from 50 to 300 deg. F. superheat.

The section on piping includes information for figuring piping for handling water, saturated and superheated steam, and velocity and pressure drop of water and steam flowing through piping. In this section is included also the proposed American standards for high pressures. Engineering data on coal and oil fired boilers, which include tables of heat values for gaseous, liquid and solid fuels.



ced on the market by Los Angeles manufacturer

Proposed Changes in Basic Freight Rate Structure

Various Rock Products Industries Are Filing or Preparing To File Briefs on Their Commodities

A JOINT resolution of Congress, approved January 30, 1925, directed the Interstate Commerce Commission:

To make a thorough investigation of the rate structure of common carriers subject to the interstate commerce act, in order to determine to what extent and in what manner existing rates and charges may be unjust, unreasonable, unjustly discriminatory, or unduly preferential, thereby imposing undue burdens, or giving undue advantage as between the various localities and parts of the country, the various classes of traffic, and the various classes and kinds of commodities, and to make, in accordance with law, such changes, adjustments, and redistribution of rates and charges as may be found necessary to correct any defects so found to exist. In making any such change, adjustment, or redistribution the commission shall give due regard, among other factors, to the general and comparative levels in market value of the various classes and kinds of commodities as indicated over a reasonable period of years to a natural and proper development of the country as a whole, and to the maintenance of an adequate system of transportation. In the progress of such investigation the commission shall, from time to time, and as expeditiously as possible, make such decisions and orders as it may find to be necessary or appropriate upon the record then made in order to place the rates upon designated classes of traffic upon a just and reasonable basis with relation to other rates. Such investigation shall be conducted with due regard to other investigations or proceedings affecting rate adjustments which may be pending before the commission.

On March 12, 1925, the Interstate Commerce Commission issued General Order No. 17000 which included the following statements:

Briefly summarized, the purpose of this investigation is to comply with the joint resolution in order to determine the extent and manner in which the rate structure of common carriers subject to the interstate commerce act is in any respect unlawful, and to make in accordance with law such changes, adjustments, and redistribution in that rate structure as may be necessary tc correct any defects found to exist.

In discharge of this duty the commission will not enter at once upon extensive hearings. It intends to conduct the investigation in a manner conducive to full and orderly development of material facts and with as little delay and expense to shippers, carriers, and the Government, and as little disturbing effect upon production, distribution, and the free flow of commerce, as may be found practicable. Necessary or appropriate decisions and orders may be made in the progress of the investigation.

Changes, if any, in the rate structure of the country, under the resolution, will be made after giving due consideration, among other factors, to:

(1) The conditions which prevail in the several industries of the country, in so far as it is legally possible to do so, to the end that commodities may freely move, consideration of which to such extent is declared by Congress to be the true policy in rate making to be pursued by the commission.

(2) The general and comparative levels in market value of the various classes and kinds of commodities as indicated over a reasonable period of years.

(3) A natural and proper development of the country as a whole.

(4) The maintenance of an adequate system of transportation.

(5) Other requirements of law, whether statutory or found in the Constitution, which control the commission in respect of the initiation, modification, establishment, or adjustment of such rates, fares, charges, and all classifications, regulations, and practices relating thereto.

In order that the commission may as soon as possible carry out the mandates of the joint resolution as above summarized, and in aid of such purposes, the public generally, including both shippers and carriers, whether as individuals or in organizations, and the public authorities, State and Federal, (1) may file with the commission any desired brief or statement as to the intent of the joint resolution, the construction thereof, and the procedure to be pursued in giving effect thereto; and (2) may bring to the attention of the commission any appropriate statement of the facts, verified by affidavit, deemed to bring any classes of traffic, or any class or kind of commodities, or any general or special schedule of rates, fares, and charges, or other matters embraced in the investigations, within the provisions of the resolution. In the event it is claimed that any of the various classes and kinds of commodities and of the various classes of traffic is subjected to undue burden, any traffic or commodities receiving undue advantage or on which compensatory increases could be placed if found necessary should be indicated as clearly as possible. To facilitate the study and examination of the informal representations so to be made it is desired that such memoranda shall be prepared and printed in the same form as briefs before the commission although legible typewritten or mimeographed memoranda will be received, and that at least 25 copies shall be furnished to the commission for its use, as soon as possible, and not later than May 15, 1925. A file of such memoranda will be open to public inspection in the office of the secretary of the commission. Answers to any such memoranda may be made by any interested person in like manner and be lodged with the commission not later than June 15, 1925. Such memoranda can not, under the law, take the place of evidence upon the hearing, or be given weight in the final consideration and disposition by the commission of the matters involved. They are desired for the aid and guidance of the commission in shaping its procedure.

Meantime, the commission will constitute a committee of its own membership, which, with the assistance of competent experts, and of representative of the State commissions, will study known or discoverable situations. Upon consideration of the results of such study and of the representations made by memoranda as contemplated in the last preceding paragraph of this notice, and of such applications as may be made for rehearings or further hearings in pending or decided cases, the commission will decide and announce the order of its further procedure in the pending investigation.

While it would appear that the time for filing the briefs has expired, it is generally believed that to carry out the intent of the order will take several years. Various rock products industries took advantage of the offer to file briefs including a part of the lime industry and the portland cement industry.

Lime Manufacturers' Statement

The case of the lime industry has been partly presented by the Eastern District Lime Traffic Association, of which J. L. Durnell, of the Knickerbocker Lime Co., Philadelphia, is president. In this brief it is contended:

It is evident from the resolution that the commission is not to wait until the final conclusion of this broad general investigaton to correct undue discriminations and mal-adjustments in rates which may be found to exist at this time or at any time during the course of the investigation. Accordingly, the association conceives it to be its obligation and duty to call to the attention of the commission the rate situation with respect to lime in trunk line and central freight association territory. As the commission is aware, the southern carriers have expressed their willingness to apply a uniform scale of rates on lime from all producing points south of the Ohio and Potomac Rivers and east of the Mississippi River to all points in the southern states within that boundary.

The lime rate revenue to the carriers on the basis of the proposed southern scale will be relatively higher than the revenue on all traffic. Bearing in mind that the general level of rates on all commodities in the south is somewhat higher than the level rates in trunk line and central freight association territories, it is significant that the proposed southern lime scale is considerably lower than the scale of lime rates now applicable in central freight association and trunk line territories.

Not only does this burdensome rate-level situation obtain, but the lime rates in central freight association and trunk line territories are so constructed, or rather misconstructed, that the whole rate fabric is replete with inconsistencies, inequalities and incongruities. In the very recent case of Lime from Eastern Trunk Line Points to Pittsburgh, 93 I. C. C. 617, the Commission branded these lime rates as "inconsistent and lacking in uniformity." What this mal-adjustment of lime rates has cost the lime producers in these two territories cannot well be calculated; but the burden has most assuredly been a heavy one to bear. The industry is fairly staggering under the weight of the present mal-adjustment in the rate structure.

Studies by the association have revealed that these lime rates have not been built up on any uniform basis; that they are unduly excessive and produce for the carriers revenues not only far exceeding those which a low-grade commodity such as lime worth approximately $8 per ton should contribute towards the support of the railroads, but revenues which are far above that produced by high-grade commodities worth many times the

value of lime. To illustrate with respect to a few commodities from Baltimore, Md., to Pittsburgh, Penn.:

Commodity	Rate	Value per ton	Value per car	Freight charges per car
Cocoanut oil, crude	25½c	$210	$5274.68	$128.10
Copper, ingot	22	256	8832.00	151.80
Tin, pig	24½	1058	38294.31	177.33
Linseed oil	25½	247.46	6215.58	128.10
Lime	16½	8.28	236.97	94.45

The freight charge per ton on lime constitutes a substantial proportion of the value of the product and is restrictive of the distance over which the commodity may move. This notwithstanding the lime is loaded and unloaded by the shipper. The raw material, or limestone, from which lime is produced, is indigenous to only a relatively few localities. The obsolescence or depletion of the raw material is exceedingly heavy and the margin of profit is narrow. The above mentioned percentage increases in rates have presented a situation which it has been practically impossible to meet and it is solely by reason of the practice of the most rigid economy and deprivation of profits that the lime industry has been able to continue its operations. However, the industry today is operating far below normal.

These horizontal increases in rates have disrupted price and rate relationships and the industry is in imperative need of the stimulus of a lower level of rates built on the basis of uniformity and consistency. It might be added that neither this association nor its members have been able by most earnest and continuity of effort to prevail upon the carriers to work out or inaugurate a reasonable and harmonious lime rate adjustment in trunk line or central freight association territory. Their salvation theretore rests in the hands of this commission.

In considering the lime situation, the fact should not be lost sight of that lime, of all the low-grade commodities, is most peculiarly related to farming and agricultural products. Indeed, it may be said that the productivity of the farm and the volume of farm products is in a large degree dependent upon the movement and supply of lime. It seems logical therefore to expect from the commission a readjustment of the lime rates as early as is consistent with the performance of its multiplicity of duties, so that in a measure the treatment of rates on agricultural products and lime may go hand in hand.

With the application of the rates voluntarily proposed by the southern carriers the lime rate structure of the entire south will be harmonized on a level agreeable to a great majority of the producers, and with the promulgation by this commission of orders directing the revision of rates within Central Freight Association territory and from Trunk Line to Central Freight Association territory, as proposed by the complainants and eastern interveners in Docket 16170, the effect will be to establish a level and basis of rates within those territories that will bear a very close relationship to the level and basis of rates voluntarily proposed by the carriers in the south. Furthermore, the bringing together or harmonizing of these two immense subdivisions of the United States will go a long way towards eliminating complaints of discrimination among the various producers and will provide a constructive and well-thought-out plan of lime rates everywhere east of the Mississippi river that will be fair to the carriers and compatible with the maintenance of adequate transportation service.

Cement Association Statement

The attitude of the portland cement industry is different from most other industries —it is not asking for lower rates but for *stability* of the rate structure. The statement of the Portland Cement Association by F. E. Paulson, chairman of the transportation committee, reads in part:

Various statements that have been filed are premised on the principle that an adequate system of transportation must be maintained. We fully agree with this principle, and we urge your commission so to act that nothing will be done to impair the efficiency of the present system of transportation nor interfere with its future development. With this thought in mind we contend that the public will be misled by the suggestion made in the notice to the public dated March 12, 1925, as follows:

"In the event it is claimed that any of the various classes of traffic is subjected to undue burden, any traffic or commodities receiving undue advantage on which compensatory increases could be placed if found necessary should be indicated as clearly as possible."

In response to the foregoing suggestion various interests have filed statements arguing for reductions in rates on their respective commodities. Any rate reduction involving a substantial volume of traffic, without compensating increases, would certainly impair the ability of the carriers to serve the public adequately. The only alternative would be to recoup carriers' losses by an increase in rates on other commodities. This shifting of the transportation burden would almost certainly result in commercial chaos.

The present laws governing the regulation of carriers by the Interstate Commerce Commission require that those who claim to be injured by the existing rate structure must proceed in lawful manner to present such claims of injury to your commission, setting forth definitely the manner in which the existing rates work to their detriment.

General charges have already been made that by comparison cement rates are too low. The cement industry emphatically affirms that its rates bear their full proper proportion of the transportation burden. Moreover, the portland cement rates, effective within large portions of the United States, have been fixed by your commission after exhaustive investigations.

The resolution of congress is premised upon the thought that there may be inequalities in the present rate structure, and the purpose is to develop the facts upon an orderly record. It logically follows, therefore, that those who invoke the resolution should be required definitely to point out the burdens upon their own commodities, to name the commodities receiving the benefits, and to state with some degree of certainty the territory within which the alleged preferential rates operate, thereby serving as notice to the industries whose rates are under attack.

Uncertainty as to the future rate is growing rapidly, with attendant anxiety, and your commission is respectfully urged to make an announcement at an early date with respect to the foregoing, in order to remove the growing sentiment that an upheaval of the entire rate structure is impending.

Talc and Soapstone in 1924

THE total quantity and value of talc and soapstone sold by producers in 1924 was 203,821 short tons, valued at $3,515,556, according to figures issued by the Department of the Interior, through the Geological Survey. These figures represent an increase of 4% in quantity and of 17% in value over the amounts for 1923. There were 27 producers in 1924, as compared with 25 in 1923.

The following table shows the quantity and value of talc and soapstone sold in 1924, by states, and the percentages of increase or decrease from 1923.

The talc industry in New York in 1924 was prosperous, and the sales showed substantial increases in quantity and value over 1923. A new use for talc as an ingredient in concrete to make it waterproof was reported to the Survey by one company, which made experiments with favorable results. This company has also experimented with special grades of talc as a high-grade paper filler, and the results are reported to have been satisfactory.

The year opened in Vermont with increasing firmness in prices over 1923. The demand was good and remained so until the end of April. A quiet two months followed, and in July signs of improvement were again noticeable, with a gradual tendency toward better conditions until about the first of November, when the demand again declined.

In the South soapstone was mined with renewed activity in North Carolina and Virginia; in Maryland there was a gain of two producers and greatly increased sales over 1923, and in Georgia sales of talc crayons were noticeably larger.

State	1924 Short tons	1924 Value	Per cent of total quantity	Percentage of increase or decrease from 1923 Quantity	Value
New York	78,340	$1,162.488	38	+ 10	+ 8
Vermont	61,653	573,747	30	— 8	+ 8
Virginia	28,219	1,306,388	14	+ 8	+36
California	16,335	247,799	8	+ 1	+10
Pennsylvania and New Jersey	8,281	83,296	4	+ 1	+ 1
North Carolina	6,093	81,523	3	— 6	— 9
Maryland	3,015	29,767	2	+420	+17
Georgia	1,885	30,548	1	+137	+84
	203,821	$3,515,556	100	+ 4	+17

Phosphate Rock Mined and Shipped in 1924

THE phosphate rock shipped from mines in the United States in 1924 amounted to 2,771,000 long tons, valued at $9,740,000, according to preliminary figures made public by the Department of the Interior, which were compiled by the Geological Survey. Florida, the leading state, shipped 2,336,000 long tons, worth $7,507,000, more than nine-tenths of which was land-pebble phosphate. Shipments from Tennessee and small quantities from Kentucky amounted to 396,000 tons, worth $2,039,000. Idaho, Montana, and Wyoming made small shipments.

The phosphate rock mined in the United States in 1924 amounted to 2,756,000 long tons, which is 6% less than that mined in 1923. More than four-fifths of it was mined in Florida. Most of the remainder was mined in Tennessee and Kentucky, though a small quantity was mined in Idaho, Montana, and Wyoming.

Start Work on Lake Harbor for Universal's Buffington Plant

WITH all necessary preparations completed, actual construction work on the new $3,000,000 lake harbor for the Buffington, Ind., plant of the Universal Portland Cement Co., was started June 23, officials of the company announced. The new harbor is to be continued just west of the cement plant, the largest in the world. The harbor will be nearly a mile long and the largest of the lake vessels will be able to navigate its waters.—*Chicago Tribune.*

International Buys Indiana Cement, Capital Increase Authorized

STOCKHOLDERS of the International Cement Corporation at their annual meeting at Portland, Maine, approved the proposed increase of common from 400,000 to 600,000 shares and preferred from 50,000 to 150,000 shares. This increase in capital is being made to acquire additional plants and properties in the United States.

The corporation has already purchased the Indiana Portland Cement Co., whose plant at Greencastle, Ind., described in Rock Products, October 9, 1918, and April 8, 1922, issues, has a productive capacity of 1,500,000 bbl. annually and it is said that negotiations for the purchase of other properties will be closed by July 1.

If the additional properties now under consideration are purchased, it is proposed to issue approximately 67,500 additional shares of preferred stock. In the meantime 100,000 additional shares of common stock authorized, are to be offered pro rata to common stockholders of record at the close of business June 23, 1925, on the basis of one new share for every four shares now outstanding, at the rate of $50 per share. Warrants covering rights will be mailed as soon as possible after June 23.

Authority was also given to the directors to reserve 20,000 shares of the common stock for sale to officers and employees of the corporation, at the discretion of the board, at not less than $50 per share.

The management of the Indiana company will be vested in men who have been long associated with the International System. They are: H. Struckmann, president; Chas. L. Hogan, vice-president and manager; H. A. Ross, assistant manager. The new board, in addition to the foregoing men, includes: F. R. Bissell, chairman; Galen L. Stone, Charles Hayden and Richard F. Hoyt.

Commenting on the sale, H. Struckmann, who now becomes president of the Indiana Portland Cement Co., said: "As a member of the International System, the Indiana Portland Cement Co. will operate under the same policies now followed by the other seven companies of the System. These policies are a development of over twenty years' experience in cement manufacture and merchandising and are responsible in large measure for the size and strength of the International System today."

The annual production of the International Cement Corporation with this addition totals 10,000,000 bbl.

John W. Boardman Honored

JOHN W. BOARDMAN, who is one of the most outstanding figures in the cement industry in Michigan, has been elected a director of the Michigan Manufacturers Association. Mr. Boardman is active vice-president of the Huron Portland Cement Co. and the Wyandotte Portland Cement Co., which operate six plants, three of which are located in Michigan, one each at Alpena, Wyandotte and Detroit. He is also treasurer and a director of the Portland Cement Association. This latter office is indicative of his high standing in the portland cement manufacturing industry. His election as a director of the Michigan Manufacturers Association is a fitting recognition of his ability as a business executive.

Mr. Boardman is a son of the late John W. Boardman, Sr., of Jackson, who, with his partner, W. F. Cowham, was a pioneer in the portland cement industry in Michigan. These men founded Cement City, located near Jackson, which has become a thriving community owing to the cement industry established there. Later plants were established in Kansas, Iowa and Texas, all of which were successes.

Idaho Cement Company Orders Machinery for New Plant

OFFICIAL announcement was made recently by the Idaho Cement Co., successor of the Lewiston Portland Cement Co., in the *Lewiston (Idaho) Tribune* that it has ordered machinery from the Kennedy-Van Saun Mfg. & Eng. Corp. for a cement plant which will be erected on Mission creek, near Culdesac, Idaho. The plant will have an initial capacity of 1500 bbl. daily, is expected to be ready for operation by April 1, 1926, and will cost approximately $1,250,000. One 240 by 10 ft. kiln will be installed. The plant is designed to permit a doubling of its capacity.

Marble and limestone deposits were secured by lease from the United States government and 4½ miles of narrow gage track will be laid from it to the 120-acre clay deposit and plant site, which has been purchased by the company. A mile and a half railroad spur will be constructed from the Camas Prairie Ry. at Jacques Spur to the plant. T. J. Klossoski is engineer in charge of construction.

The company has contracted with the security firm of Charles W. Gillet Co. of Chicago for the financing of the plant through the sale of its securities. Elliot Richardson is president.

Cement Company and Dealers Charged with Illegal Combination

A PORTLAND cement manufacturing company and a building materials dealer in the Middle-West were recently indicted by an Indiana county grand jury on the charge of forming a combination in restraint of trade.

The indictment charges that when a certain party sought to buy a cement mortar made by the cement company, the latter company refused to sell the materials to it. It is charged that the building materials dealer along with others were in combination and had informed the cement company that they would buy no more of this mortar if the company sold any to the party seeking to buy direct. As a result of this notice from the supply dealers' combination the cement company refused the sale, according to the indictment charges.

Contract Let for New California Cement Plant

THE general contract for the proposed plant of the Calaveras Cement Co. at San Andreas, Calif., as noted in the May 30 issue of Rock Products, has been let to the MacDonald Engineering Co. of San Francisco. The plant includes mill, power house and machine shop, estimated to cost $1,750,000. The Calaveras company has offices at 900 Commercial Union building, San Francisco.

Missouri Highway Commission Not Offering Free Agricultural Limestone

EDITORS, Rock Products:

Gentlemen: We note an article in the June 13 issue of Rock Products relative to the furnishing of pulverized limestone free of charge to farmers in competition with producing stone companies.

For your information we would advise that the Associated Press article in regard to free agricultural dust from Missouri state quarries was without foundation in so far as we know. We have no supplies of limestone dust. Any dust produced at quarries from which we are purchasing stone is very naturally the property of either the producer or the land owner and we have no part in the disposition of the same.

Very truly yours,

B. H. PIEPMEIER,
Chief Engineer.

By F. V. Reagel,
Engineer of Materials.

Kelley Island Company Re-elects Officers

AT the annual meeting of the stockholders of Kelley Island Lime and Transport Co., Cleveland, Ohio, on June 9, the old board of directors were elected without change. The directors in annual meeting on June 12 re-elected the 1924 officers of the company.

The company will pay a cash quarterly dividend of 2% on July 1, to holders of record June 20.

V. O. Johnson Represents Sand and Gravel Industry at Mineral Conference

V. O. JOHNSON, secretary of the Pacific Coast Sand and Gravel Association, speaking for the sand and gravel producers at the California Mineral Conference held at Los Angeles, May 15 and 16, said: "As producers of railroad revenues, we are second only to coal, averaging 8000 cars per day. Including truck and water transportation, our production approximates 500,000 tons per day, representing an increase of more than 100% in the last five years. Our problems are those incident to production, transportation, and marketing—and the greatest of these is marketing."

Engineers and Designers of New York Trap Rock Corporation's Verplanck Plant

THE article in Rock Products June 13 issue describing the new Verplanck plant of the New York Trap Rock Corp., near Peekskill, N. Y., inadvertently failed to mention a very important point—that the plant was designed and built by the Burrell Engineering and Construction Co., Chicago, in co-operation with R. T. Gent of the New York Trap Rock Corp. The Burrell Engineering and Construction Co. are experienced builders of cement and other industrial plants. We are glad to bring this to the attention of Rock Products' readers because, as every reader knows, we have consistently advocated the employment of engineering specialists in the design and construction of rock products plants, and this particular plant is a splendid example of the advantages of such expert engineering supervision.

Williams-Laflin Sand and Gravel Company Soon to Operate New Plant

THE Williams-Laflin Sand and Gravel Co., Texarkana, has constructed a washed sand and gravel plant 3½ miles north of De Queen, Ark., and will begin operations in about a week. The gravel deposit covers 64 acres and is along the Kansas City Southern Ry.

The construction of the plant is in charge of Frank M. Welch, chief engineer of the Greenville Gravel Co., Greenville, Ohio. The plant will have a capacity of about 35 cars of washed and graded product daily.

Chester S. Williams is president and Don C. Laflin secretary-treasurer of the company.

Missouri Cement Re-elects Officers and Directors

STOCKHOLDERS of the Missouri Portland Cement Co., St. Louis, Mo., in annual meeting recently re-elected the following directors: R. S. Colnon, John Hill, C. W. Johnson, John F. Lee, C. A. Lemp, Morris Skrainka, J. Sheppard Smith, D. N. Armstrong, A. Wessel Shapleigh, O. G. Besch, C. A. Homer, George M. Block and H. L. Block.

The directors met and re-elected the following officers: President, H. L. Block; vice-presidents, George M. Block, C. H. Homer and R. S. Colnon; vice-president and treasurer, O. G. Besch; secretary, John H. Soell.

A Correction

A NEWS NOTE in Rock Products, June 13, p. 72, stated that H. Dittlinger, president of the Dittlinger Lime Co., New Braunsfels, Tex., was "a native of Germany." On advices from one of Mr. Dittlinger's associates we hasten to correct that statement, for it seems he is a native of old Missouri—being born at Cape Girardeau. He was educated in German technical schools; his father was one of the famous 48'ers, among whom were Carl Schurtz and other Germans who became prominent in American life.

H. Dittlinger, of New Braunsfels, Texas

Los Angeles Sand and Gravel Plant Destroyed by Fire

DAMAGE estimated at from $75,000 to $100,000 was caused June 13 by a fire which completely destroyed the rock crushing plant, including valuable equipment of the Los Angeles Rock and Gravel Co., at Avenue Thirty-four and Arroyo Seco, Los Angeles, Calif.

"Producers Studying Aggregate"

Editor, Rock Products.

Sir:

In your issue of May 2, I have observed that you commented editorially with respect to the address delivered at our last convention by Robert H. Ford, assistant chief engineer of the Rock Island Lines, and that it seems to be your impression that Mr. Ford "told the members of the National Sand and Gravel Association that they knew very little about the application of their product."

May I suggest that your statement is not wholly correct. A careful reading of Mr. Ford's talk will reveal that he intimated that the members of the National Association were not fully informed as to the *gravel ballast* requirements of the railroads. He made no reference to the other uses of properly prepared sand and gravel, and I am concerned for fear your editorial might lead your readers to think that Mr. Ford accused our members of a complete lack of information about their product. Such a thought, as you will readily agree, would be erroneous.

However, I think the gravel producers might well retaliate by saying to Mr. Ford that the railroads, themselves, are not in agreement as to the kind of ballast which will meet their requirements, and one of the purposes of the Washed Gravel Ballast Committee of the National Association is to put in the hands of the carriers the information concerning our materials which we know they should have.

It will be noted that Mr. Ford stated that "In my judgment, the advantages of crushed, washed, and screened gravel are greater over the crushed rock." A gravel which will conform with these requirements is essentially, of course, a product which has received a thorough plant preparation. The investment in equipment necessary for such a preparation means that the railroads should be willing to pay a reasonable price for a high-grade material which will answer this description.

T. R. BARROWS,
Executive Secretary,
National Sand and Gravel Assn.

News of All the Industry

Incorporations

Flint Washed Sand and Gravel Co., Flint, Mich., $26,000.

Concrete Brick Co., Detroit, Mich., $30,000; offices at 1615 Ford Bldg.

Gardner Concrete Co., Miami, Fla., $25,000; by F. C. and M. C. Weed and others.

Mohawk Limestone Products Co., New York, $100,000. (United States Corporation Co.). (See page 62.)

Quality Sand and Gravel Co., Denver Colo., $10,000; H. D. Carlton, S. E. Norton and Mark Hanna.

Klamath Sand & Gravel Co., Klamath Falls, Ore., $15,000; by W. D. Miller, A. F. Graham and others.

Weaver Sand Co., Inc., New Orleans, La., $10,000; by W. A. Weaver, 1010 Maison Blanche Bldg., and others.

Southern Asbestos and Magnesia Co., Los Angeles, Calif., $25,000; by E. T. Betts, H. D. Ainslie and J. D. Binford.

Limestone Rock Asphalt Co., Tampa, Fla., $500,000. Robert W. Sanders is president and D. Basil O'Connor is secretary.

Clay County Crushed Rock Co., Birmingham, Mo., $18,000. (Attorneys, Humphrey & Pew, Rialto building, Kansas City, Mo.)

Coast Gravel and Construction Co., Reedsport, Ore., by T. A. Sweeney; company has offices in the Franklin building.

Standard Mica Co., Boston, Mass., $500,000; Joseph F. Haley, president; Francis D. Flynn, treasurer, 24 King Street, Boston.

Stockton Rock and Gravel Co., Stockton, Calif., $200,000; R. and Catherine Goold and P. W. Thomas. Will operate rock crushing plants in San Joaquin valley.

Atlantic Magnesite Products Co., Margate City, N. J., $25,000; L. A. Corey, J. McNesby, S. Gartland. (Attorneys, Thompson & Haustein, Atlantic City, N. J.)

Arkansas Amiesite Asphalt Co., Little Rock, Ark., 1000 shares of no par value; E. J. McInerney, president; Lee Miles, vice president; O. D. Hatfield, secretary; Dwight Smith, treasurer.

Marble and Asbestos Veneering Co., Nashville, Tenn., by A. J. Bright. Will manufacture building blocks or slabs from a mixture of cement and asbestos, with a finish veneering of ground marble, granite, onyx and other ornamental stone found in Tennessee and Alabama.

Cement

Lehigh Portland Cement Co., Allentown, Penn., is planning the construction of a bag shed at its Oglesby, Ill. plant.

Atlas Portland Cement Co., New York, has acquired part of the Gower farm near Kunketown, Monroe county, Penn., adding to its large holdings either by ownership or lease of all the mineral rights, with few exceptions, along the Chestnut Ridge Mountains from Kunketown to Saylorsburg.

La Auxiliar de la Construccion S. A., Barcelona, Spain, manufacturers of "Sanson" and "Volcan" brands of portland cement, to facilitate the handling of increasing business, has moved its offices to more spacious quarters on the second floor of No. 230 Diputacion street, where the sections of direction and administration and all other commercial parts of the company will be installed.

Monarch Cement Co., Humbolt, Kan., will install another tube mill and two General Electric 600-hp. supersynchronous motors, which will be arranged for direct connection to the geared shafts of the tube mills. These two motors will replace two 400-hp. belted induction motors effecting a necessary saving in space for the new tube mill. Three 40-hp. G. E. varying speed motors will be used for driving the kilns.

Sand and Gravel

George Erbes has installed equipment and is now producing washed and graded sand and gravel at his gravel pit east of Mendota, Ill.

Colonial Sand and Stone Co., New York, recently purchased 50 Pierce-Arrow trucks for distribution of sand and gravel in the metropolis.

Anderson Sand and Gravel Co., Rockford, Ill., recently purchased a tract of land in Rockford township for about $30,000 and will use it for a gravel pit.

Producers Rock and Gravel Co., Victoria, B. C., recently placed into operation its new 90 ft. scow for shipping sand and gravel from its pits at Albert Head.

Umpqua Dredging and Construction Co., Reedsport, Ore., has recently installed considerable new equipment for obtaining and grading sand and gravel from the Brandy bar in the Umpqua river.

Grant County Sand and Gravel Co., Marion, Ind., has completed and is now operating its new $40,000 washed sand and gravel plant. Five hundred yards of washed and graded product are produced daily.

The sand and gravel plant of the Southern New York Ry. at Blood's Mill, near Mohawki, N. Y., has been equipped throughout to use electric power and is in operation, producing 1000 yd. of sand and gravel daily.

Iron Mountain Gravel Co., Gurdon, Ark., at a meeting of its stockholders reorganized and elected the following officers: W. H. Squier, president; Annie M. Strauss, vice president; G. R. Strauss, secretary and treasurer.

Flesher Sand and Gravel Co., Mt. Vernon, Ind., has sold its steamer "Monitor" to the United States engineering department and chartered the steamer "Nellie" to take its place in the company's operations in the Ohio river at Shawneetown, Ill.

Champion Sand and Gravel Co., Ocean City, N. J., has installed an 8 in. Morris pump and all electric power equipment at its new plant, capacity of which is 100 tons of gravel and 600 tons of sand daily. Ira S. Champion is the president of this recently organized company.

Louis K. Porter, Klamath Falls, Ore., is erecting a $10,000 washing and screening plant to produce sand and gravel from the Williamson river. A Sauerman dragline excavator will be installed and 200 yards of sand and gravel produced daily.

Union Rock Co., Los Angeles, Calif., will construct 6000-ton service bins on Alameda street, Compton, Calif., and plans have been approved by the city building department. Spur tracks will be laid to afford shipping facilities. The cost of the project is estimated at $38,000. Rock produced at Azusa, Calif., will be shipped to this bunker.

General Concrete Products Corporation, Starbrick, Penn., has installed a new washing and screening plant in connection with its sand and gravel operations in the Allegheny river at Starbrick. The plant is now producing 500 yards daily. Officers of the company are: Frank Hagerty, president; Walter Beaty, vice president; H. W. Baker, treasurer; and F. W. Chaffee, secretary and general manager.

Quarries

Camp Concrete Rock Co., Ocala, Fla., now has a fully equipped plant in Brooksville, Fla., with daily capacity of 2000 tons crushed and washed stone.

Norton Rock Co., Kansas City, Kan., was ordered to cease operations at 27th street and State line by the city commissions recently as a result of complaints from the residents.

Bakersfield Rock and Gravel Co. has plans for erection of a crushing plant with a capacity of 50 tons per hour near Bakersfield, Calif. Fred C. Macomber is president of the company.

Polk County Chert Co., Cedartown, Ga., has been organized, with C. L. Scarborough as president, and E. Darden Borders as treasurer, and will install machinery for excavating, screening, crushing and moving chert.

Cement Products

W. F. Severa, Cedar Rapids, Ia., will erect a concrete block curing chamber to cost about $2,000.

Evansville Block Co., Evansville, Ind., has moved into its new cement products plant at 31 Star avenue. B. S. Gilpatrick is general manager.

W. A. Marks, of Nashville, Tenn., has organized a company to manufacture Duntile. The plant has been located temporarily at 106 N. Third avenue.

Interlocking Cement Stave Silo Co., Wichita, Kan., has acquired a three acre triangular tract of property between Murdock avenue, Elm street and the Frisco R. R., on which it will erect a new plant.

Lakeside Ice and Coal Co., Mt. Clemens, Mich., is now operating its new cement block plant, which has a capacity of 2000 blocks daily though but 500 are being produced at present. G. F. Pingel is superintendent.

Dixie Building Tile Co., Okeechobee, Fla., is constructing a plant at Hale avenue and Tallahassee street to manufacture a patented interlocking, waterproof concrete block. Max Ginsberg is principal owner and manager of the company.

Bristol Cement Works, Bristol, Va., suffered considerable damage from fire at its cement block plant and warehouse recently. The loss was estimated at $27,000, of which $6,000 is covered by insurance. Ernest and James Rainero are owners of the business.

Concordia Concrete Products Co., Concordia, Kan., will install machinery to manufacture Duntile. The plant originally manufactured only cement stave silos and has gradually expanded, now making concrete culvert pipe, lawn furniture and garbage containers.

Moline Cast Stone Co., Moline, Ill., is having an $18,000 plant constructed at First Ave. and 18th St. by the Odell Construction Co., of East Moline, for the manufacture of cinder concrete blocks. The plant will be ready for operation in about six weeks.

Chandler Construction Co., Birmingham, Ala., has installed an Otto Walter machine in its plant and is now manufacturing concrete roofing tile in a number of colors. The company is composed of Asa N. Chandler and W. L. Riggs and has an office at 2223 Age-Herald building.

Concrete Products Co., Birmingham, Ala., is operating its roofing tile plant at full capacity. It has a large number of contracts, including: eight filling stations for the Standard Oil Co.; Crestview, Haden, Mims, Robinson, Lonergan, Highland Court, Hampton, Charles Robertson, and D. O. Nichols, apartments; residences of T. P. English, J. H. Duquire, Chichester & Co., Mrs. W. B. Smith, J. W. Wimberly, J. H. Berry Realty Co., Dr. D. F. Rucks, J. W. Johnson, J. A. Head, L. K. Mackey, C. L. Newman, John Farrell, Pegram & Meade, A. M. Ford and Clyde Nelson.

Sarasota Cement Products Co., Sarasota, Fla., recently incorporated for $50,000 by J. F. Baumgartner and R. P. Thacker, is building a plant and installing equipment to manufacture "Stone-Tile" along with other cement products. It recently contracted with the National Stone Tile Corporation for the manufacturing agency for this product in Sarasota and vicinity. The plant will make a variety of building blocks, roofing tile, septic tanks, rustic seats, burial vaults, and lawn furniture. Shipping facilities are afforded by the Seaboard Air Line Ry., which is adjacent to the plant.

Agricultural Limestone

Blackwater Stone Co., Blackwater, Mo., has entered a contract with a five county limestone pool, including Henry, Pettis, Johnson, Lafayette and Saline counties, Mo., to furnish them with agricultural limestone at 60 cents per ton in carload lots, f. o. b. Blackwater, according to a statement in the Marshall, Mo., *Democrat-News*. The limestone will be ¼-in. down and the arrangement extends until October 1.

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Air Compressors - Air Brakes
Agricultural Machinery
Condensers

Lime

New England Portland Cement and Lime Co., Rockland, Me., has completed the construction of foundations and begun the erection of the kilns at its new lime plant. W. R. Phillips is general manager of the company.

Northwest Lime Co., Seattle, Wash., which will construct a modern lime plant as noted in our May 2 issue, announces officers as follows: Lawrence Keefe, president; Charles E. Clendenny, vice president and general manager; D. L. Evans, vice president; Charles H. Graves, secretary and treasurer; and Dr. Charles W. Littlefield, trustee.

Talc

T. C. Baker, of Purcellville, Va., contemplates installing a plant at Alexandria, Va., to develop a talc and soapstone deposit.

Rock Asphalt

W. M. Bramlette of Lebanon, Tenn., representing an eastern development company, has secured an option of a 100-acre deposit of rock asphalt belonging to J. E. Akin of Hampshire, Tenn. Preliminary surveys have been made and actual operations are planned for the near future, it is said.

Manufacturers

Edgar Allen and Co., Sheffield, England, have been appointed sole distributors and selling agents in Great Britain and Ireland for Bates valve bag filling machines. Mail address is Imperial Iron Works, Sheffield.

Timken Roller Bearing Co., Canton, Ohio, announces with deep regret the retirement of Heman Ely, vice president and treasurer, from active connection with the company. Mr. Ely has been an officer in the company for 16 years and announces no plans for the future other than a short vacation. The officers of the company now are: H. H. Timken, president; W. R. Timken, J. G. Obermier, M. T. Lothrop and H. J. Porter, vice presidents; J. F. Strough, secretary and treasurer.

Personals

Francis A. Emmons, advertising manager of Foote Bros. Gear and Machine Co., was elected secretary of the Engineering Advertisers Association at its annual meeting recently.

Howard C. Wheaton, assistant manager and purchasing agent of the Argentina Portland Cement Co., subsidiary of the International Cement Corporation, sailed with his wife on June 20 on the S. S. Southern Cross from New York City for Buenos Aires after a visit of a few weeks in this country.

Obituaries

Arthur Burke, Jr., son of Arthur P. Burke, of Atlanta, Ga., was killed in an automobile accident recently. He was 18 years old.

John H. Hayward, founder of The Hayward Co., New York, died at Teaneck, N. J., on June 14, at the age of 78. After graduating from a military academy, Mr. Hayward took a position in the Manhattan Savings Institution, where he stayed for several years. He then went into the produce business and was a member of the New York Produce Exchange. Later, as a result of associations with Dr. Johnson, an inventor, he became interested in machinery and invention through which interests he became general manager for the Manhattan Dredging and Elevating Co. When this company expired he began the building of automatic buckets, the outgrowth of which enterprise is The Hayward Co. At the time of his death he was vice president and treasurer of this company.

Trade Literature

Raymond Bros. Impact Pulverizer Co., Chicago, has recently issued a pamphlet giving a record of results produced by a Raymond roller mill installation at the plant of the St. Louis Screw Co.'s plant for coal pulverization.

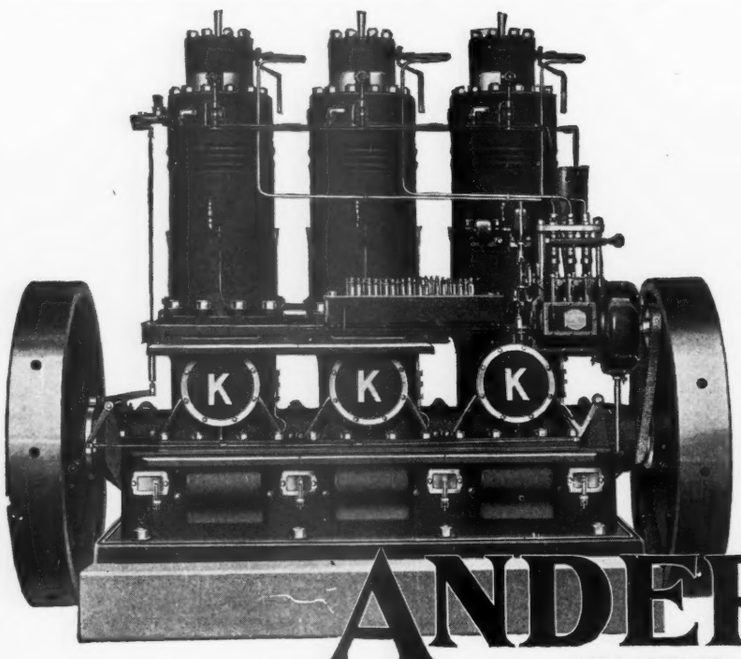
Link-Belt Co., Chicago, has issued an eight-page booklet, which describes the operation and use of the Link-Belt gondola car dumper. The book gives photographs of installations and line drawings showing method of operation.

Orton and Steinbrenner Co., Huntington, Ind., has compiled catalog No. 37, which gives extensive information on its complete line of cranes, shovels and buckets. A large number of photos illustrate the equipment and installations. Tables of the lifting capacities of the different cranes are also given.

D. J. Murray Manufacturing Co., Wausau, Wis., has prepared bulletin No. 303, which describes and illustrates the E. M. Bassler air and gas scrubber which the company is manufacturing. The illustrations are very good and include detail and assembly sectional views of the scrubber and its application to cement kilns and pulverized coal plants.

Associated Metal Lath Manufacturers, Inc., Chicago, has issued a folder entitled "The A-B-C of Metal Lath Erection." It gives practical information for those who wish to familiarize themselves with the proper erection of metal lath as a plaster base. Proper weights of the material for different walls and ceilings are listed. Copies obtainable from the manufacturers at 127 W. Madison street, Chicago.

Fairbanks, Morse and Co., Chicago, has issued a beautiful new bulletin No. 1040 entitled "Modern Methods in Diesel Engine Building." This bulletin pictures the present day engineering refinements that enter into the construction of Diesel engines and indicates what these refinements mean to the purchaser. A number of photographs illustrate the text, which is lucid and complete.



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